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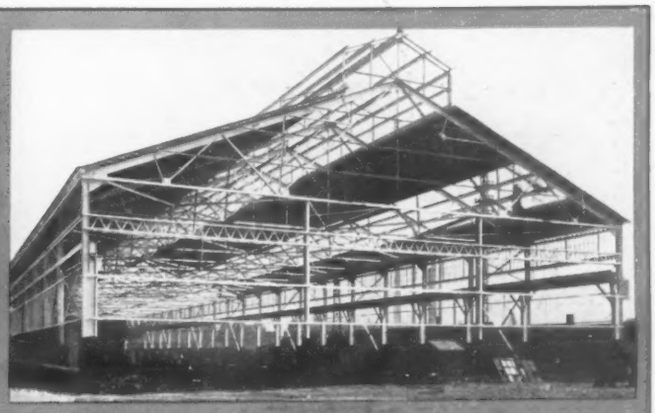
STEEL

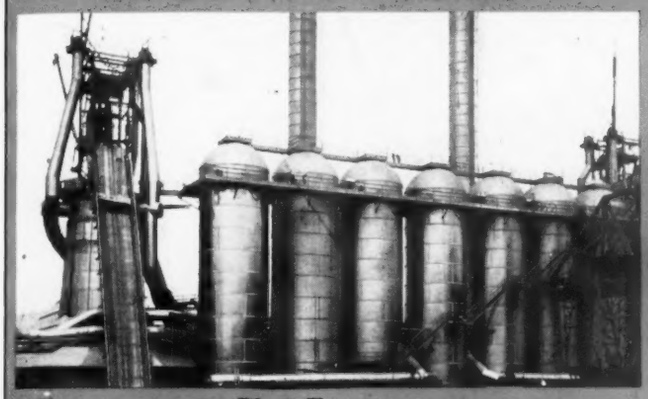
For forty-eight years—IRON TRADE REVIEW

January 15, 1931

Mill Building
Coshocton Iron Co., Coshocton, Pa.

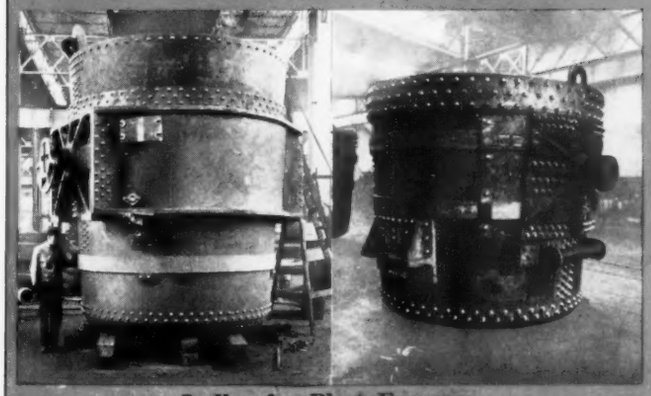


Mill Building
Timken Roller Bearing Co., Canton, O.



Blast Furnace
Carnegie Steel Co., Rankin, Pa.

Steel River Barges for
Coal, Oil, Sand, Gravel, Steel, etc.



Ladles for Blast Furnaces
and Steel Plants

Railroad Bridge for Big Four R. R.
Ohio River—Louisville, Ky.

McClintic-Marshall
STEEL

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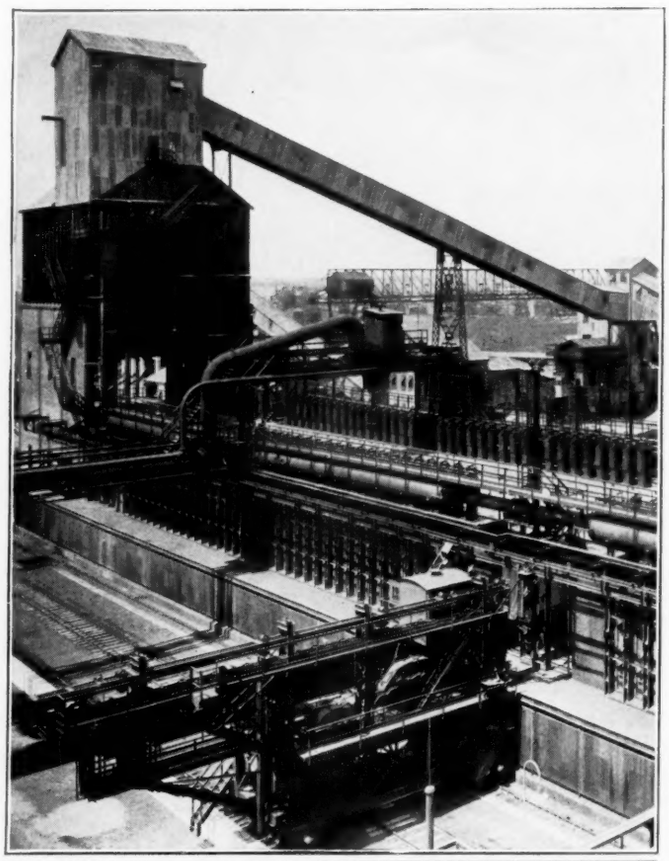

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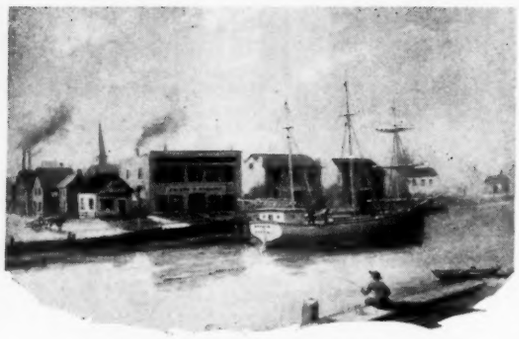
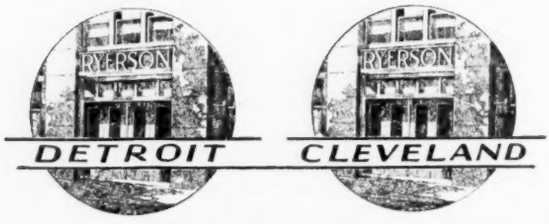


Original Ryerson Iron Store at Chicago, in 1842

Now There are 10



The years pass—. The small iron store of '42 has grown until now there are ten large plants that serve industry with Immediate Steel.

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STEEL-SERVICE

Volume 88 Number 3

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

SINCE Judge Jenkins at Youngstown, Dec. 29, handed down his hastily-written decision enjoining the Bethlehem-Sheet & Tube merger the ruling passion of financial writers has been to speculate on the probable consequences. While the principals and their lawyers still were painstakingly examining the decision and exploring the legal terrain ahead, even greater mergers were being put together —on paper. Now, the fog is lifting and it can be stated authoritatively that, at this time, the merger situation is as follows: Whether the Jenkins ruling will be appealed has not yet been definitely decided but chances are it will be, if for no other reason than the desire of pro-merger forces to prevent their being saddled with the cost of the Eaton opposition; Bethlehem continues of a mind to enter the Middle West markets more aggressively in a production way, and if it cannot have Sheet & Tube, which it still prefers, it must seek some other entering wedge; a union of Bethlehem, Sheet & Tube and the Eaton steel properties is most improbable, as more than one holiday season will pass before the opponents in the present proceeding exchange Christmas cards; Jones & Laughlin will continue independent, its owners not wishing to sell and no group having sufficient free cash to buy it; the Block brothers at Chicago have not been consulted recently concerning their willingness to part with Inland. This is exactly where the merger matter stands today (Page 15).

Can This Be the Promised Co-Operation?

Washington, meanwhile, is staging a merger of its own, Republican insurgents and Democrats again having joined forces to harass the President. Steel, like other industries, now is only an interested spectator at the conflict over appointees to the federal power commission, but it may unwittingly become an innocent bystander if the quarrel is sufficiently prolonged to force an extra session of congress. While business has become shockproof, or practically so, certainly no good and possibly some harm will flow from a turbulent congress sitting all spring and well into the summer, just when business needs a maximum of quiet for its convalescence. . . . Fortunately, no major business legislation is endangered. Unemployment relief is in the application rather than the legislative state. Railroad consolidation is not a legislative matter. Some delay might accrue to the proposal of the house immigration committee (Page 16) that for two years all alien quotas be reduced 90 per cent.

Comeback in Steel Production Encouraging

The business community continues to look to steel as a barometer, and not in vain. More rapidly than expected, steelmaking operations

This first heat from the new open-hearth furnaces of the Great Lakes Steel Corp., Detroit, poured last November, started a new era in Detroit. All six furnaces of the company now are ready for action

have snapped back since the holidays and now averaging 45 per cent neutralize all the loss since mid-November (Page 61). Fresh buying, however, has been less a factor than shipping orders on material held up in December and the automatic release of rail tonnage. . . . While the 8.35 per cent increase in unfilled tonnage of the United States Steel Corp. Dec. 31 is encouraging (Page 18), the seasonal element cannot be ignored.

Soon Use 1930 as Business Yardstick

Business turned one psychological corner New Year's day and it will round another when the final statistical report for December and 1930 become history, thereby concluding comparisons with record 1929. True, setting early 1931 business against 1930 will not always disclose improvement, as for example the estimate of railroad regional advisory boards that freight car requirements in the first quarter will shrink 5.5 per cent from a year ago (Page 17), yet the general effect will be wholesome. . . . Government reports reveal the production of 67,000 tons of manganese ore, 35 per cent or better, in 1930 was a gain of 11 per cent over 1929, but the market value was less. Based upon actual imports for 11 months, 1930 receipts of foreign manganese ore were 550,000 tons, of which Russia supplied 206,039 tons (Page 17).

Steam Heat Not a Luxury for Iron Ore

Iron ore in transit from stock piles to trestle bins at blast furnaces no longer has a chance to freeze. Ore transfer cars recently placed in service have hoppers double lined and insulated on the exterior with asbestos (Page 39). A small forced-circulation coal heater located in the cab supplies hot air to the doors and the body of the hopper, preventing lumps building up on the slopes. . . . Application of auxiliary equipment to conventional-type sheets mills not only has eliminated hard physical labor but has also minimized the cost of conversion (Page 41). The pack furnace speeded up production; now, similar furnaces have been introduced for heating the pairs. Mechanical conveyors, feeders and catchers have moderated the duties of mill crews. Five methods of rolling sheets are charted. . . . Chicago machinery dealers have provoked the displeasure of the federal trade commission, which would banish their plan for appraising old machine tools (Page 16).

Below the Sidewalks of New York

Not all of New York's underworld is pernicious. In fact, a vital portion of it is the steel nerve center which permits this great city to function. Because the rock upon which Manhattan towers lies so close to the surface there is economy in erecting buildings with no basement and purchasing the necessary services from utilities. One steam corporation alone operates lines totaling 220,000 lineal feet and is a large buyer of steel pipe (Page 24). . . . Building is a major industry in New York, and each night structural material, fabricated and dispatched in sequence of use, is barged from the Jersey shore to the job in Manhattan (Page 24). . . . So swift has been the race for height that the Woolworth building now ranks only fifth (Page 25). . . . Standardized metal windows, delivered to the job already installed, account for 150,000 tons of metal, chiefly sheets and strip, each year (Page 25). . . . Soon they may be operating two elevator cars in one shaft.

Way Cleared for Larger Automotive Output

By all the laws of business economics, substantial recovery of business and employment should occur in 1931, is the conclusion put upon an analysis of the motor car market by the head of an automobile financing company (Page 33). . . . He shows how readjustments in 1930 have paved the way for a larger output this year, and asserts that many other articles purchased on the deferred payment plan, such as radios, iceless refrigerators, furnaces, electric supplies and the like are in an approximate relative position. . . . The vast market existing for steel as a material for residential construction has been pointed out in this country. Europe likewise has been experimenting with steel houses. In France five different designs have been devised each requiring a sizable amount of steel shapes (Page 35). . . . Bessemer steel output is receiving impulse in the Mahoning valley as reduced operating schedules make its low production cost more attractive (Page 61).

Pipe Lines an Aid to Gas Equipment

Steel pipe lines, 12,000 miles of which either were completed recently, are in process of construction or projected, will lead to an increase in the use of natural gas for heat treating equipment, according to a prominent metallurgist (Page 38). . . . He sums up progress in the heat treating industry, emphasizing the growing importance of the cost factor now that peak operation in many instances has fallen off to only average proportions. . . . High temperatures and pressures in the operation of pressure vessels have imposed stringent demands on these units and when welding is employed as a method of fabrication joints must be of unquestionable quality. Nondestructive testing of welded joints by X-ray and hydrostatic tests of finished drums are methods which have been adapted successfully (Page 44). A recent fatigue test on the arc welded drum resulted in the drum withstanding over 2,000,000 applications of internal pressure.

Bethlehem Still Would Go West; Merger Appeal Likely

PRO-MERGER forces have not yet decided whether they will appeal from the decision of Judge David G. Jenkins, of Youngstown, O., enjoining the purchase of the Youngstown Sheet & Tube Co., by the Bethlehem Steel Corp.

Important questions of law and policy are being considered, and it seems probable that an appeal will be sought, but the pro-merger group has until Jan. 27 to act, and in view of the factors to be weighed before embarking upon such a course, no decision is likely in the next few days.

But whether or not an appeal will be taken, Bethlehem, it may be stated authoritatively, has not receded from its determination to extend its interests in the Middle West. The principal reasons prompting the attempted union of Bethlehem and Sheet & Tube have not been changed by the decision.

Bethlehem still prefers Sheet & Tube as its entry into production in the Middle West. If, in view of what has developed since the merger first was broached last March, another entering wedge appears advisable, it may be assumed that it will be employed.

Rumors Are to Be Discredited

Since the Jenkins ruling of Dec. 29, speculation has been rife, extending even to a giant merger embracing Bethlehem, Sheet & Tube, Jones & Laughlin, Inland and Republic. Those close to the situation are firmest in their opinions such a combination is not possible or probable.

In view of the differences which have developed since last March between the Bethlehem and Sheet & Tube group on one hand, and Cyrus S. Eaton and his associates on the other, a working agreement does not appear possible.

Control of Jones & Laughlin rests with a group which, it is generally understood, is unwilling to sell except at a price which under normal conditions would preclude any meeting of minds. This large independent is predicating its future plans on the basis of continuing independent.

Several times in the past few years a merger of Sheet & Tube and Inland has been attempted, but without success and so far as is known no conversations involving either these two companies or the two plus Republic have been held recently.

As authoritatively as can be stated, no plans for a "super merger" have been laid and the presence of Messrs. Eaton, Campbell and Grace in New York recently was a coincidence.

The pro-merger group has a number of serious questions to consider of interest to all stockholders before proceeding with the case. If the case is appealed a bond must be filed. This bond has been fixed at $10,000 by Judge Jenkins.

Hearing of the appeal might be postponed owing to the absence of Newton D. Baker, counsel for Sheet & Tube, who is taking a vacation abroad. The plaintiffs could ask for an immediate hearing, and it might be granted.

To Drop Case Means Expense

If the merger group lost the appeal it would have little difficulty in getting the case into the Ohio state supreme court, as the law gives this court broad discretionary powers to review any case wherein public interest is at stake. To appeal the case to the supreme court and get a decision would take at least a year.

If the merger group stops now it would be compelled to pay the court costs, as ordered by Judge Jenkins. It also faces the possibility of having to pay counsel engaged by Mr. Eaton. The law gives the court the right to compel the losing side to pay the winning side's counsel fees if in its judgment the expense was righteously incurred in defending and protecting stockholders' interests.

It would be in accordance with the usual procedure for the winning side in this case to ask the court of common pleas to assess its attorneys' fees against the defendants.

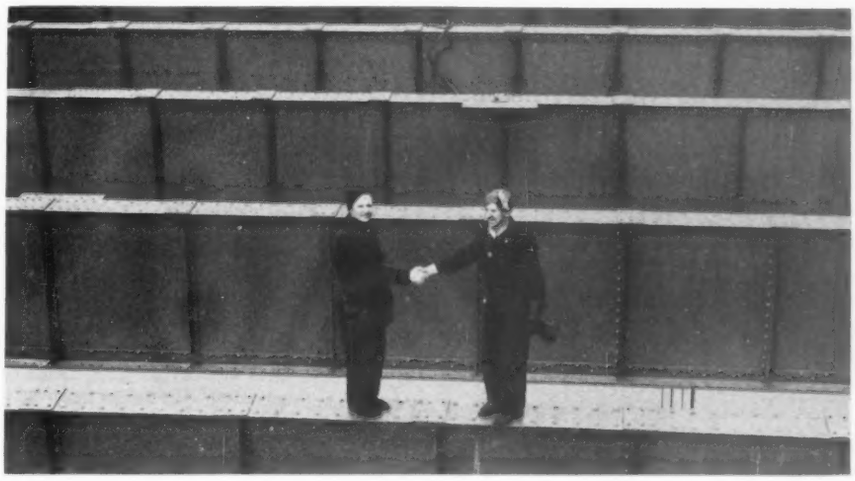
Court costs and opposing lawyers' fees would run into hundreds of thousands of dollars for Bethlehem and Sheet & Tube, not including their own lawyers' fees. If they drop the case it is fairly certain they will have to pay a considerable portion of all the costs incurred by their opponents.

See Reversal Possible

Furthermore, the merger group feels that there is some chance of reversing the decision. Interests identified with the group point out that the Supreme Court has ruled repeatedly an individual can hold the position of director in two companies when these companies do not compete. This point was considered during the merger negotiations and it was not believed that a legal objection could be interposed on that score.

Also, it is felt that no corporation could get very far with its operations if each director were required to know as much about the details of the company's affairs as a judge supposed he should. This was the rock on which the merger split, the court holding that the directors should have been more informed. The pro-merger group contends that they were sufficiently informed to pass sound judgment on the question of merging.

The pro-merger group believes it has enough stock and proxies to effect a merger strictly in accordance with all the principles of law laid down in the case. It is almost a



International News Photo

STEEL MEETS IN CENTER OF LARGEST BRIDGE

A steelworker from the New York end of the new suspension bridge across the Hudson river at New York greeting a worker from the New Jersey end as the steel for the flooring of the world's largest suspension bridge met in midstream. Much work remains to be done, and opening ceremonies are planned for 1932

foregone conclusion, however, that this would lead to another fight, first concerning stock values and proxies, and then to court action on some technicality.

The presumption is that there is a leaning toward an appeal, but as indicated numerous questions still are to be decided.

Deny Bethlehem, Republic and J. & L. Merger Talk

New York—Emphatic denial that negotiations were in progress looking to consolidation of the Bethlehem Steel Corp. and the Republic Steel Corp. has been made in sources identified with the management of both these companies. Recent reports associated these companies and also the Youngstown Sheet & Tube Co., Jones & Laughlin Steel Corp., Corrigan, McKinney Steel Co. and Otis Steel Co., as being considered in negotiations alleged to have taken place in New York.

Threaten Demand Bonus Paid by Bethlehem Be Returned

New York—Demand that the Bethlehem Steel Corp.'s directors make restitution of bonuses estimated at $36,000,000 paid to officers of the company since 1927 will be made by a group of stockholders. This group consists of stockholders of the Midvale Steel & Ordnance Co. who received Bethlehem stock when Midvale was absorbed several years ago.

A committee representing this group states the bonuses were paid chiefly to officers of the Bethlehem corporation who also were directors. The committee reports it is ready to make its presentation general for all stockholders and to receive authority from other stockholders to act on their behalf. The committee consists of Henry B. H. Ripley, Samuel D. Hopkins, Edwin D. Levinson and Benjamin M. Robinson, the latter being secretary of the committee with offices at 15 Broad street. Messrs. Ehrich, Royall, Wheeler and Walter are its counsel.

Stock Suit Postponed

Youngstown, O.—Hearing of the suit to determine a fair value of Youngstown Sheet & Tube Co.'s common stock held by persons opposed to a merger with Bethlehem Steel Corp., has been postponed by Judge David G. Jenkins to March 10. The hearing was originally set for Jan. 12. The merger contract between the two companies expired Jan. 15, having been renewed three times because of litigation. No announcement has been made as to its renewal.

Federal Trade Commission Hits Chicago Machinery Appraisal Plan

WASHINGTON—Formal complaint has been issued by the federal trade commission against the Chicago Machine Tool Distributors, its directors, executive committee and members, alleging unfair methods of competition in connection with the "Chicago Appraisal Plan."

The membership of the organization, the commission states, comprises about three-fourths of all dealers in heavy tool machinery in the territory known as the Chicago district. The plan was put into effect Oct. 1, 1928, but was not formally adopted by the association until April 12, 1929.

"Since Oct. 1, 1928," says the complaint, "said respondents, Chicago Machine Tool Distributors, its board of directors, executive committee and members of said association, have been and are now engaged in combining and co-operating together and among themselves in the operation and carrying out of said 'Chicago appraisal plan.'

"The 'Chicago appraisal plan' is for the purpose, and has the effect and result of restricting, restraining and suppressing competition in interstate commerce between the respondent members of respondent association in the purchase and sale of old machines or machinery which are offered in part payment on a new machine or machinery by purchaser, and the purchase and sale of new machines or machinery, and results in said purchasers being deprived of free, open competitive market for their said used or old machines or machinery, which they would have access to and enjoy in the absence of the 'Chicago appraisal plan' which is being operated through the co-operation of said respondent Chicago Machine Tool Distributors, and the individual respondents officers, directors, executive committee and members of said association."

The commission gives the respondents until Jan. 16 in which to file an anhwer to the charges in the formal complaint.

The Business Week in Washington

HOUSE immigration committee has approved a reduction in immigration which for two years lowers present quotas 90 per cent, as urged by Secretary of State Stimson. The senate has not yet acted on the proposal of Senator Reed, of Pennsylvania, to restrict immigration to relatives of aliens now in the United States.

□ □ □

Secretary Mellon is opposing a resolution pending before the banking and currency committee of the house, which provides that all foreclosure proceedings by federal land banks in drought stricken areas be suspended for a year.

□ □ □

Federal trade commission has issued a formal complaint against the Chicago Machine Tool Distributors and its members, charging unfair competition in connection with its "Chicago Appraisal Plan" for valuing used machinery.

□ □ □

Representative Kelly, of Pennsylvania, ranking majority member of house postoffice committee, has stated no members of the committee favor the suggestion of the postmaster general that rates on first class postage be increased from 2c to 2½c.

□ □ □

John W. Pole, comptroller of the currency, in a recent statement said that common sense, hard work and constructive, courageous leadership will bring about a "normal return of business operations at the earliest possible, economically favorable moment."

□ □ □

Carriers in trunk line, New England and central freight association territories filed a petition with interstate commerce commission asking postponement of the effective date of its third supplemental order in part six, iron and steel articles, investigation 17,000, relating to rates on plated or sheet pipe, from Feb. 16 to April 17.

□ □ □

John Barton Payne, chairman of the American Red Cross, told the senate committee on appropriations his organization is able to meet all demands on it. James A. Wetmore, acting supervising architect, told the committee the government's public building and public works programs are moving ahead full speed.

Books License Tonnage

New York—Faitoute Iron & Steel Co., Newark, N. J., iron and steel jobber, has booked the license tag

tonnage for New Jersey for 1931. Approximately 900 tons of pickled, re-annealed sheets of No. 20 gage stock are required. Material will be fabricated by a stamping company in the Newark district.

Domestic Manganese Ore Shipments Up; Imports Off

Shipments of manganese ore containing 35 per cent or more of metallic manganese from mines in the United States totaled approximately 67,000 gross tons in 1930, according to the bureau of mines. This was an increase of 11 per cent compared with the 60,379 tons shipped in 1929. The value of the ore in 1930, however, was less than that shipped in 1929, $1,454,000, compared with $1,612,357.

During the first 11 months of 1930 the United States imported 528,747 gross tons of ore, containing 251,691 tons of metallic manganese. Assuming the imports for December were at the same rate as in November total imports would be approximately 550,000 tons, containing 262,000 tons of metallic manganese. Total imports in 1929 were 664,269 tons of ore containing 323,415 tons of metallic manganese.

Imports from soviet Russia for the first 11 months of 1930 were 206,039 tons of ore containing 102,440 tons of metallic manganese. Brazil furnished 163,848 tons of ore containing 70,678 tons of metallic manganese. Other imports came from India and British West Africa, with metallic manganese of 26,228 tons and 42,078 tons, respectively.

Says Machine Tools Afford Rather than Decrease Jobs

More employment instead of less has resulted from the widespread use of machine tools, work has been made easier, life and limb have been spared, and the wage earner has been enabled to live in comfort and luxury, said Franklyn Hobbs, director of research, Central Trust Co. of Illinois, Chicago, in an address Jan. 9 before the machine tool distributors, Chicago district.

"It is true that in the last 30 years time saving methods and tools have driven two workers out of three away from the bench and left the third man drawing just as much pay as the three men before the tools arrived," Mr. Hobbs said.

"The two men were driven from that bench to other benches at an increased wage in every case. Plant employment increased 16 per cent faster than in the last 30 years than population increased, while plant wages increased more than 200 per cent. This answers all questions as to effects of machinery on employment and wages."

First Quarter Car Needs 5.5 Per Cent Below 1930

SHIPPERS have gone on record as estimating they will need 6,568,456 freight cars in the first quarter of 1931 for transportation of the 29 principal commodities. Surveys submitted to the Shippers' Regional Advisory boards anticipate a 5.5 per cent reduction, or 380,607 cars less than those actually used in first quarter of 1930.

Declines are general by districts, only one of 13 marking an increase. This section, the Pacific coast states of California, Nevada, Arizona and part of New Mexico, believes it will need 4 per cent more freight cars the coming three-month period.

Greatest decrease is expected in the Ohio valley region, 12.6 per cent, followed closely by 12.5 per cent among shippers of the Pacific northwest. Allegheny district carloadings should be 3.9 per cent less and Great Lakes section down 6.9 per cent.

These estimates are furnished quarterly to the advisory boards, which cover the entire United States, and are based on the best information as to the outlook obtainable at that time. The aggregate membership of the boards is some 16,000 persons, representing virtually every industry.

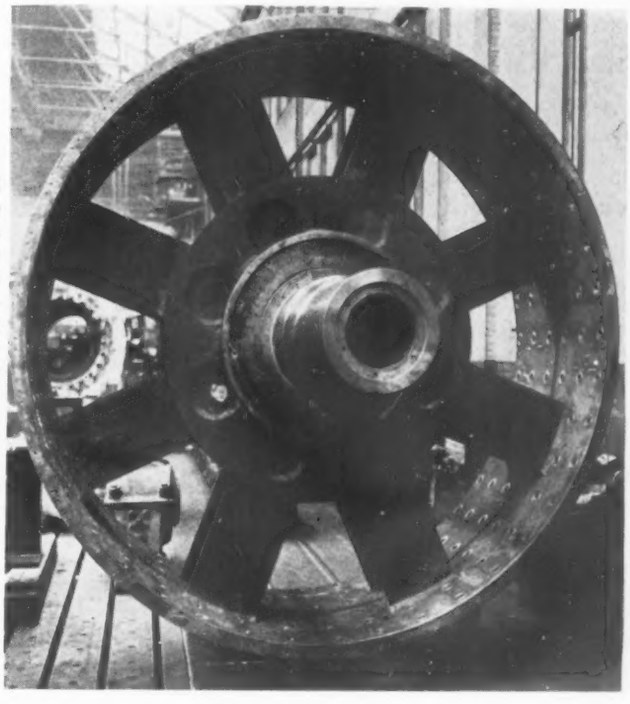
Among the 29 commodities, transportation requirements will develop increases for the following five: All grain, citrus fruits, other fresh fruits, vegetables except potatoes, and all canned goods. Commodities for which decreases are estimated totaled 24 and include iron and steel, automobiles and machinery.

Car Needs Compared

District	Actual cars loaded 1st quar. 1930	Estimated 1st quar. 1931	Per cent change
Midwest	1,165,355	1,092,794	6.2—
Allegheny	934,141	897,671	3.9—
Southeast	820,767	791,258	3.5—
Ohio valley	813,019	710,235	12.6—
Atlantic	755,558	747,198	1.1—
Southwest	496,000	458,018	7.7—
Great Lakes	388,646	361,657	6.9—
Trans-Miss.-Kans.	386,230	370,362	4.1—
Central West	295,005	284,020	3.7—
Northwest	240,039	231,069	3.7—
Pacific Coast	263,089	273,043	3.8+
Pac. Northwest	221,865	194,201	12.5—
New England	169,768	156,930	7.6—
Total	6,949,063	6,568,456	5.5—

Sharon Plant Is Sold

Sharon, Pa.—Plant of the former Sharon Pressed Steel Co., Wheatland, Pa., near here, has been purchased for Philadelphia interests. Purchase was made from Joseph Greenspon & Sons Iron & Steel Co., which took over the plant three years ago.



Welding was used in fabricating this rotor 148 inches in diameter for a ship propulsion motor to develop 13,250 horsepower. Maximum efficiency of connections is sought and exceptional vibrational stresses are to be withstood. The rotor was fabricated by the Westinghouse Electric & Mfg. Co.

Unfilled Tonnage Rise Best in 1930; Most Statistics Off

UNFILLED orders on the books of the United States Steel Corp. Dec. 31 totaled 3,943,596 tons, being a gain of 303,960 tons or 8.35 per cent over Nov. 30. This was the largest monthly gain in 1930 or 1929. Due to booking of considerable track material in December, this improvement is largely seasonal, although nonethe-less encouraging. A year ago, unfilled orders of the Steel corporation totaled 4,417,193 tons. Comparisons follow:

Date	Total	Change, tonnage	per cent
1929			
Jan. 31	4,109,487	132,775+	3.34+
Feb. 28	4,144,341	34,854+	0.84+
Mar. 31	4,410,718	266,377+	5.70+
April 30	4,427,763	17,045+	0.38+
May 31	4,304,167	123,596—	2.88—
June 30	4,256,910	47,257—	1.10—
July 31	4,088,177	168,733—	3.90—
Aug. 31	3,658,211	429,966—	10.50—
Sept. 30	3,902,581	244,370+	6.68+
Oct. 31	4,086,562	183,981+	4.71+
Nov. 30	4,125,345	38,783+	0.95+
Dec. 31	4,417,193	291,848+	7.74+
1930			
Jan. 31	4,468,710	51,517+	1.20+
Feb. 28	4,479.748	11,038+	0.25+
Mar. 31	4,570,653	90,905+	2.03+
April 30	4,354,220	216,433—	4.73—
May 31	4,059,227	294,993—	6.78—
June 30	3,968,064	91,163—	2.24—
July 31	4,022,055	53,991+	1.36+
Aug. 31	3,580,204	441,851—	10.9—
Sept. 30	3,424,338	155,866—	4.35—
Oct. 31	3,481,763	57,425+	1.68+
Nov. 30	3,639,636	157,873+	4.53+
Dec. 31	3,943,596	303,960+	8.35+

Steel Barrel Output Steady

Production of steel barrels in November of all types was at a daily average of 40,400 units, by report of members to the Steel Barrel Manufacturers' association, Cleveland. Total percentage of barrels used during the month was 35.5. Barrels shipped during November totaled 308,120, compared with October's 398,885. During the latter month daily average production for all barrels was also 40,400 units.

Locomotives Low for Year

Shipments of railroad locomotives in November totaled 43, compared with 50 in October and 95 in November of 1929. Unfilled orders on Nov. 30 aggregated 93 locomotives, also a decline from October's 132, according to report from the principal manufacturing plants to the bureau of the census, monthly figures for which follow:

	Shipments		Unfilled Orders	
1929	Domestic	Foreign	Domestic	Foreign
Nov.	75	20	389	9
(11 mos.)	679	100	.....	.....
Dec.	63	4	483	7
(Year)	746	104	.....	.....
1930				
Jan.	48	.....	577	10
Feb.	64	3	525	8
March	66	2	529	6
April	94	3	461	3
May	56	2	410	9
June	80	1	335	8
July	55	1	284	7
Aug.	73	4	229	5
Sept.	65	.....	169	5
Oct	50	.....	127	5
Nov.	43	.....	88	5
(11 mos.)	695	19	.....	.....

Structural Steel Bookings Are Low in November

Bookings of structural steel in November slid off from the gains made in November and only 157,200 tons were computed to have been booked by all plants, according to bureau of the census estimates. Bookings were at only 39.3 per cent capacities. Shipments likewise were down. Following computed figures for the entire industry are based on actual reports from 83 per cent of the fabricating industry:

	Bookings		Shipments	
1929	Tonnage	Per cent capacity*	Tonnage	Per cent capacity*
Nov.	212,135	55.1	263,725	68.5
(11 mos.)	3,300,220	77.9	4,060,365	72.2
Dec.	297,605	77.3	246,400	64.0
(Year)	3,597,825	77.9	3,306,765	71.6
1930				
Jan.	248,800	62.2	241,600	60.4
Feb.	278,800	69.7	295,200	73.8
March	246,800	61.7	278,400	69.6
April	232,000	58.0	298,800	74.7
May	290,800	72.7	279,200	69.8
June	263,600	65.9	296,000	74.0
July	282,800	70.7	291,200	72.8
Aug.	264,000	66.0	277,600	69.4
Sept.	162,000	40.5	258,400	64.6
Oct.**	219,600	54.9	253,600	63.4
Nov.	157,200	39.3	206,800	51.7
(11 mos.)	2,646,400	60.2	2,976,800	67.6

*Capacity: 1928 and 1929—385,000 tons; 1930—400,000 tons.
**Revised.

Steel Plates Turn Upward

Orders for fabricated steel plate in November totaled 26,137 tons, compared with 24,002 in October, gains being recorded in oil storage tankage and gas holder tonnages. October's aggregate was low for 1930, according to the bureau of the census from 48 firms, the following showing new orders by months:

1929	Total	Oil storage tanks	Blast furnaces	Stacks & miscellaneous
Nov.	42,295	9,033	1,019	14,601
(11 mos.)	489,530	135,181	10,598	207,615
Dec.	23,535	3,669	1,529	13,166
(Year)	513,065	138,350	12,127	220,781
1930				
Jan.	50,076	7,432	1,042	15,168
Feb.	28,332	7,865	279	11,656
March	38,051	6,593	2,749	17,675
April	39,437	8,460	273	17,698
May	30,306	9,222	426	13,228
June	35,307	8,841	511	16,944
July	31,440	10,350	102	13,165
Aug.	29,235	9,388	750	15,695
Sept.	33,602	14,106	514	12,084
Oct.	24,002	4,400	231	13,170
Nov.	26,137	9,401	179	9,631
(11 mos.)	365,985	96,558	7,056	157,114

Castings Output Continues Decline for Nine Months

New orders for commercial steel castings in November were 33 per cent of shop capacity, as against 32 per cent in October. Production in November was 31 per cent of capacity, compared with output at a 41 per cent rate in October, according to bureau of census reports from 132 firms having present monthly capacity of 144,300 tons and representative of over four-fifths the industry. Monthly comparisons follow:

	Total bookings tons	Per cent of capacity	Total production tons	Per cent of capacity
1929				
Nov.	97,888	67	110,297	76
(11 mos.)	1,249,747	78	1,249,062	78
Dec.	90,287	62	106,569	73
(Year)	1,340,034	77	1,335,631	78
1930				
Jan.	101,728	70	109,296	76
Feb.	104,727	80	107,897	75
March	122,658	85	113,737	79
April	93,200	65	110,903	77
May	91,307	63	105,242	73
June	61,358	43	90,985	63
July	58,069	40	79,181	55
Aug.	51,464	36	64,403	45
Sept.	49,542	34	61,919	43
Oct.*	45,552	32	59,522	41
Nov.**	47,862	33	44,303	31
(11 mos.)	836,519	53	947,434	60

*Revised. **Preliminary.

Babbitt Metal Production Eases Off in November

November total production of babbitt metal for sale by the 21 concerns which report to the bureau of the census their monthly sales was 1,-

806,819 pounds comparing to 1,962,-156 for October. Companies who report their sales produce approximately 62 per cent of the babbitt produced for sale. Total apparent consumption declined in November due largely to losses recorded in consumption by producers. Monthly figures follow:

	Total apparent consumption	Sold by manufacturers	Consumption by producers
	(Figures given in pounds)		
1929			
Nov...	4,522,034	3,205,689	1,316,345
(11 mos.)	61,791,369	47,764,601	14,026,768
Dec...	3,343,492	2,394,159	949,333
(Year)	65,134,861	50,158,760	14,976,101
1930			
Jan...	4,408,455	3,405,041	1,003,414
Feb...	3,426,576	2,525,771	900,805
March	5,051,575	4,039,395	1,012,180
April	3,868,408	2,838,877	1,029,531
May	3,932,501	3,003,298	929,203
June	3,702,989	2,546,606	1,146,383
July	2,907,977	2,022,058	885,919
Aug.	2,737,121	1,783,331	953,790
Sept.	2,765,153	1,730,269	1,034,884
Oct.	2,988,914	1,962,156	1,026,758
Nov.	2,582,450	1,806,819	775,631
(11 mos.)	38,377,119	27,663,621	10,708,948

Financial News of Steel Industry

ARTHUR G. McKEE & CO., Cleveland, net earnings for 1930 are estimated at $547,350 according to preliminary report at stockholders' meeting Jan. 12. This was a 22 per cent gain from actual net of $446,740 for 1929.

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National Acme Co., Cleveland, has voted dividend of 20 cents a share, payable Feb. 1 to record Jan. 15. Company has been paying $1.50 a year.

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Wright Machine Co., Worcester, Mass., declared fourth full dividend in 1930, making total annual disbursement of 7 per cent.

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Glancy Malleable Corp., Waukesha, Wis., recently offered $200,-000 issue of first mortgage 6½ per cent serial gold bonds at 100 and interest.

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Johnson Iron Works, Dry Dock & Shipbuilding Co. Inc., New Orleans, declared regular quarterly dividend of $2 a share and an extra $1 on account of accumulations, both paid Jan. 1 to record Dec. 26.

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American Can Co., New York, has declared regular quarterly dividend, payable Feb. 16 to record Feb. 2.

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Collyer Insulated Wire Co., Pawtucket, R. I., paid quarterly dividend of 25 cents a share Jan. 1. Quarterly distribution of 50 cents a share was made in October.

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Murray-Ohio Mfg. Co., Cleveland, has omitted quarterly 40-cent dividend ordinarily payable Jan. 1. Last quarterly distribution at this rate was made in October.

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Sundstrand Machine Tool Co., Rockford, Ill., omits common dividdend ordinarily due about Jan. 15. Quarterly distributions of 25 cents a share made on July and Oct. 15 last, compared with 50 cents quarterly previously.

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A. M. Byers Co., Pittsburgh, reports earnings of $2.74 a common share in fiscal year ended Sept. 30, 1930, comparing with $5.81 a share in same period ended in 1929.

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Cockshutt Plow Co., Brantford, Ont., reports working capital of $6,-256,100 for the year ended November, 1930, compared with $6,453,970 the previous year. Operating profits were $327,799, which after all charges, left deficit of $115,655 compared with surplus of $624,980 for the previous year.

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Blaw-Knox Co., Pittsburgh, reports for 11 months ended Nov. 30, 1930, net profit after all charges of $2,410,-476.

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Reynolds Spring Co., Jackson, Mich., report net loss of $330,188 for nine months ending Sept. 30, 1930. This compares with profit, before taxes, of $186,050 in first nine months of 1929.

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Detroit-Michigan Stove Co., Detroit, has omitted semiannual dividend ordinarily payable about Jan. 10.

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General Foundry & Machine Co., Flint, Mich., is offering $250,000 first mortgage, 6 per cent serial gold bonds at prices to yield 6 to 6½ per cent, according to maturity.

1930 Steel Ingot Production Is 25 Per Cent Under 1929

FULL effect of the decline in steel production in 1930 is revealed in comparison of total steel ingot production in the accompanying table, compiled by the American Iron and Steel institute, New York. The total of 39,652,539 gross tons is slightly under 75 per cent of the 54,312,279 tons of 1929. This is a decline of 25.37 per cent in 1930.

The daily average for the year, at 127,500 tons, was the lowest since 1924, when the average for the year was 117,984 tons, July of 1924, registering the low average at 72,223 tons, compared with 77,222 tons for December, 1930. Total production for a year also goes back to 1924 for a lower figure, the total in that year being 36,-811,157 tons.

Steel Ingot Production—1929-1930

94.27 Per Cent of Industry Reporting
Gross Tons

	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	Number of working days	Approximate daily output all companies	Per cent of operation
1929							
Dec.	2,375,797	360,489	2,736,286	2,903,012	25	116,120	59.21
Total	44,101,321	7,091,680	51,193,001	54,312,279	311	174,638	89.05
1930							
Jan.	3,137,002	441,572	3,578,574	3,796,090	27	140,596	70.22
Feb.	3,336,021	508,618	3,844,639	4,078,327	24	169,930	84.38
Mar.	3,513,904	539,616	4,053,520	4,299,905	26	165,381	82.60
Apr.	3,406,610	509,234	3,915,844	4,153,860	26	159,764	79.80
May	3,265,190	528,968	3,794,158	4,024,778	27	149,066	74.45
June	2,835,527	407,586	3,243,113	3,440,239	25	137,610	68.73
July	2,411,592	353,723	2,765,315	2,933,399	26	112,823	56.35
Aug.	2,543,466	374,467	2,917,933	3,095,293	26	119,050	59.46
Sept.	2,273,668	429,975	2,703,643	2,867,978	26	110,307	55.10
Oct.	2,164,830	399,704	2,564,534	2,720,414	27	100,756	50.32
Nov.	1,806,109	300,337	2,106,446	2,234,482	25	89,379	44.64
Dec.	1,665,875	226,854	1,892,729	2,007,774	26	77,222	38.57
Total	32,359,794	5,020,654	37,380,448	39,652,539	311	127,500	63.68

Figures exclude crucible and electric ingots. Operating percentages for 1929 are based on capacity of 60,990,810 gross tons as of Dec. 31, 1928; for 1930 on capacity of 62,265,670 tons as of Dec. 31, 1929.

To Sell Eastern Steel Co.

Philadelphia—Roland S. Morris, Philadelphia, special master appointed by the United States district court to sell the property of the Eastern Steel Co., Pottsville, Pa., announced Jan. 13 that Receiver Edward L. Herndon has been directed to dispose of the property and actual sale will be held in about six weeks.

Sheet & Tube Cuts Hours

Youngstown, O.—Due to the present state of the steel trade, approximately 2000 office employes of the Youngstown Sheet & Tube Co. Jan. 12 went to work on a 6-hour day basis, equivalent to salary cut of 25 per cent. Arrangement is said to be temporary, the workers to return to the usual 8-hour day with the return of better business.

The new rule applies as well to clerical help in the Brier Hill and Campbell offices. Previously clerks have been taking off one week a month without pay in order to distribute work among others.

Bethlehem Has Sales Meet

Bethlehem Steel Co. held a three-day sales conference Jan. 12-14, inclusive, at Bethlehem, Pa., which was attended by all sales executives, district managers, and other executives of the company. Chairman Schwab, President Grace, and other officers spoke at the sales dinner. Jan. 12.

Opposes New Freight Rates

Washington—W. M. Cheseldine, examiner, interstate commerce commission, made public Jan. 12 a proposed decision in connection with the rates on iron and steel articles from points in the South to trunk line and New England territories.

"Proposed rates," he said, "on iron and steel articles from Birmingham, Ala., and other southern points to trunk line, New England, and Buffalo-Pittsburgh territories, are found not justified without prejudice to the establishment of rates as indicated in the report. Suspended schedules are ordered cancelled and the proceeding discontinued."

To Junk Old Iron Mill

Crane Iron Works, Catasauqua, Pa., has been sold to an Allentown, Pa., scrap company and plant will be dismantled.

The Crane company was chartered in 1839 and was among the first to smelt iron ore, using anthracite coal. For ten years the plant has been idle. A modern furnace was erected not long ago but operated briefly.

Electrical Manufacturers Agree Basic Facts Point to 1931 Betterment

NINETEEN thirty-one should be no worse and possibly may be some better than 1930, declares Gerard Swope, president, General Electric Co., Schenectady, N. Y., in scanning the outlook for electrical manufacturers. Mr. Swope said:

"We, in the electrical industry, possibly have had more to be thankful for during the past year than those in many other lines of endeavor and this may also be true of what the future holds for us.

"New methods in industry, with electricity as their base, are being continually introduced; new uses are constantly being found for electrical apparatus and appliances in the home and new devices are being developed to meet these needs.

"Statistics of the electric light and power companies throughout the United States for 1930 reflect these tendencies, showing that there has been but a slight decline in the use of electric power by commercial organizations and in industry, and that the electric energy used in the homes, even in this year of depression, has increased over that used last year.

"We expect this course to continue, and therefore look forward with confidence, believing that the electrical manufacturing business, as a whole, in the new year should surely be no worse and possibly somewhat better than in 1930."

"This is too large and too fundamentally prosperous a country to stand still for any long period," believes F. A. Merrick, president, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in a forecast that a normal return to sound business can be expected.

"The fundamentals of a normal return to sound business in all lines are working themselves out as must be the case. While the short time outlook in the industry shows a lower trend than has been the case in recent years, extension of electrical service to the country's farms, electrification of transportation systems, electrical rehabilitation of industrial plants, construction of useful public works and increased use of electricity in the household, will increase."

Rolling Mill Engineers to Install Machinery in Russia

A party of engineers headed by W. T. Martersteck recently left New York for Kramatorsky, U.S.S.R., to design, install and operate steel rolling mill machinery for the Russian government on a three-year contract.

Personnel of the party consists of:

W. T. Martersteck, steel plant engineer; Louis B. Clark supervisor of open-hearth operation, former melter at Canton plant, Republic Steel Corp.; W. E. Fearn, supervisor of steel foundry operation, former steel foundry superintendent at the Dominion Steel Foundry Co., Hamilton, Ont.; Thomas G. Fechnay, machine shop instructor, formerly with Pratt & Whitney, Toronto, Ont.; C. Fellowes, designing engineer, rolling mill machinery, formerly with Mackintosh-Hemphill Co., Pittsburgh; W. D. Hannon, steel foundry instructor, formerly with American Locomotive Works, Chester, Pa.; Herbert H. Heiman, machine shop instructor, formerly with Morgan Engineering Co., Alliance, O.; George Hopf, machine shop instructor, formerly with Mackintosh-Hemphill Co., Pittsburgh; Joe G. Hubbard, designing engineer, formerly with the Youngstown Sheet & Tube Co. and Republic Steel Corp.; Leo F. Kelly, designing engineer, open-hearth equipment, formerly with the Morgan Engineering Co., Alliance, O.; Roy J. Leckrone, designing engineer, tube mill machinery and cold-rolling mills, formerly with E. W. Bliss Co., Salem, O.; Wm. H. McCausland, iron foundry supervisor, formerly with Bethlehem Steel Co., Bethlehem, Pa.; R. Makepeace, machine shop instructor, formerly with Mackintosh-Hemphill Co., Pittsburgh; Roland Miller, designing engineer, open-hearth equipment, formerly maintenance engineer, Massillon plant, Republic Steel Corp.; Karl E. Martersteck, calculator and designer, formerly engineer with W. J. Meagher, contractor, Bay City, Mich.; George Packard, will take care of clerical department, formerly with Youngstown Sheet & Tube Co., Youngstown, O.; Harold V. Peace, pattern shop instructor, Hamilton, Ont.; E. G. Puttman, designing engineer, blast furnace equipment, formerly with Arthur G. McKee & Co., Cleveland; Charles Trumper, supervisor of machine shop operations, formerly with John Inglis Co., Toronto, Ont.; and Douglas Turner, designing engineer of cranes, formerly with the Morgan Engineering Co., Alliance, O.

Move Industrial Brownhoist to Bay City, Mich.

Industrial Brownhoist Corp., Cleveland, will consolidate manufacturing operations of its Cleveland and Bay City, Mich., divisions at Bay City.

Directors believe substantial manufacturing economies will be effected by the Michigan location, where there is adequate space for necessary expansion. Removal will be effected as promptly as conditions permit, and will take six to eight months.

The Cleveland plant will be used for headquarters of administrative, financial, sales, purchases, accounting and part of the engineering activities.

Industrial Men in the Day's News

Carl V. Dodge, Manager of Roll and Steel Castings Sales, United Engineering & Foundry Co.

REMOVING to Pittsburgh from northern Illinois about 26 years ago, he has remained with the United company ever since.

ABROAD knowledge of production problems in rolls and steel castings has aided him in his successful sales work.

ABOUT 15 years ago he developed the present widely-used annealing box for steel sheet production, with its supported roof and sides.

AFTER more than 25 years identification with roll and steel casting production and sales in the Pittsburgh district, Carl V. Dodge recently was named manager of roll and steel casting sales of the United Engineering & Foundry Co., Pittsburgh, as noted in Steel of Jan. 8. In that capacity he succeeds the late William Gardner, whom he assisted about seven years.

Before going to Pittsburgh he was located in northern Illinois, selling diversified products in the Chicago territory. He obtained his early education in Rochelle, Ill., public schools and was graduated from high school in that city. In 1904 he was employed as shipping clerk in the chilled roll foundry department of the United company, then located at Vandergrift, Pa., and later became foreman of the cleaning floor. His next promotion made him order clerk. In 1913 he was transferred to the Pittsburgh office as a steel casting and roll salesman and during the World war was in charge of steel casting sales. When in 1921 the roll and steel casting sales departments were consolidated, Mr. Dodge was made assistant manager of sales of the combined departments.

He has a broad working knowledge of foundry operation and practice in addition to commercial ability. One of his achievements is his development work in connection with cast steel annealing boxes. His chief contribution about 15 years ago was the supported roof and sides type now in use in practically every sheet mill in this country and in sections of Europe.

His company says of him: "His practical knowledge and impressive personality, with his energetic manner, have made many enthusiastic friends for the United company and United products."

HARRY E. ROGERS, formerly assistant to the works manager of Granite City, Ill., plant of General Steel Castings Corp., has been appointed works manager, eastern division of the corporation with headquarters at Eddystone, Pa. He succeeds E. Walcher, resigned. Mr. Rogers has had 18 years experience with the Commonwealth Steel Co., beginning in 1912 as a draftsman in the engineering department. He was transferred to the finishing department and in December, 1913, was appointed assistant superintendent. Four years later he became superintendent of the finishing department, and on Jan. 1, 1930, was made assistant to the works manager, retaining also general supervision of the finishing department. Mr. Walcher previously was works manager of American Steel Foundries, Granite City, being appointed to that position

F. C. Hanke and J. P. Begley, mechanical superintendent and chief metallurgist, respectively, of General Steel Castings Corp., Eddystone, have resigned.

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S. J. Ellis has retired after being head of the Vulcan Iron Works, Memphis, Tenn., for 24 years. He founded the company, which now has been incorporated by his two sons as Vulcan Iron Works Inc. William C. Ellis is president and general manager and Crockett Ellis is secretary-treasurer. The father has followed the machinist trade for 46 years.

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J. J. Dunn, formerly general superintendent, National Tube Co., Ellwood City, Pa., has been appointed assistant to the vice president at the general offices, Pittsburgh. J. W. Offut has succeeded him at Ellwood City and G. E. Moyer has been appointed assistant general superintendent there in succession to Mr. Offut.

J. L. Mauthler and P. P. Reese have been appointed assistant general superintendents at Lorain, O.

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Ralph W. Burk, for past three years manager of the Detroit sales office of Kearney & Trecker Corp., Milwaukee, manufacturer of milling machines, has been appointed manager of the company's eastern division with headquarters in Philadelphia. He will have jurisdiction over five eastern territories. F. G.

Jackson, formerly district manager at Philadelphia, will succeed Mr. Burk in Detroit.

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J. B. Gibson has been placed in charge of the sales office at 326 Court Arcade building, Tulsa, Okla., established by Birmingham Tank Co., Birmingham, Ala.

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Karr Parker, former vice president and treasurer of McCarthy Bros. & Ford, Buffalo, has been elected president to succeed the late Edmond D. McCarthy.

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L. H. Zintgraff, 907 Security building, St. Louis, has been appointed sales representative in that territory for Allied Die Casting Corp., Long Island City, N. Y.

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O. C. Roberts has been appointed general manager of Peter Smith Stamping Co., Fordson, Detroit. J. R. Winter and Z. C. Wilkinson, in charge of plant and sales, respectively, have resigned.

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James K. Aimer has been appointed assistant general manager of sales in charge of bar iron, billet and charcoal iron boiler tube sales to railroads, for Reading Iron Co., Reading, Pa.

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Paul B. Farnsworth, secretary, Eastern Machinery Co., New Haven, Conn., has been selected for early election as president and treasurer, to succeed the late F. B. Farnsworth, whose death was noted in STEEL of Jan. 8.

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H. W. Rinearson, vice president of A. M. Byers Co., Pittsburgh, was elected president of the Wrought Iron Research association for the coming year. He succeeds P. M. Guthrie, Reading Iron Co., Reading, Pa.

G. O. Boomer, vice president and treasurer, Ewald Iron Co., Louisville, Ky., was made secretary-treasurer of the association. The organization is making plans for a new program of research work to be announced shortly.

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S. H. Truitt, identified in various sales capacities with the iron and steel industry for a number of years, has been appointed Philadelphia district sales manager with headquarters at 1828 Fidelity-Philadelphia Trust building, Philadelphia, for Newport Rolling Mill Co., and Andrews Steel Co., Newport, Ky.

E. R. Walker has been appointed St. Louis district sales manager for Newport Rolling Mill Co., and Andrews Steel Co.

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Walter Harnischfeger, formerly vice president of the Harnischfeger Corp., Milwaukee, has been elected president and treasurer to succeed his father, the late Henry Harnischfeger. Ernst Standfuss remains as vice president and R. Binkowski as secretary.

F. J. Hartmann has been elected assistant secretary and Carl Haugaard, assistant treasurer.

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Luther J. Anthony, Glenwood Range Co., Taunton, Mass., was elected president of the New England Foundrymen's association Jan. 14, at its thirty-fifth anniversary dinner. He succeeded Ernest F. Stockwell. Other officers were elected are: Leroy M. Sherwin, Brown & Sharpe Mfg. Co. Providence, R. I., vice president, and George H. Gibby, Gibby Foundry Co., East Boston, Mass., treasurer. Fred F. Stockwell was re-elected secretary.

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J. B. Knight, Columbus, Ga., was elected president of the southern chapter, Institute of Scrap Iron and Steel Inc., New York, at the organization meeting, held Jan. 8 at Tutwiler hotel, Birmingham, Ala. Other officers are: S. C. Weber, Chattanooga, Tenn., vice president, J. Thomas Knight, Birmingham, secretary-treasurer, W. M. Smith, Birmingham, and J. J. Stein, Atlanta, Ga., members of the executive committee.

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R. R. Weddell, formerly chief engineer of O. K. Tool Co., Shelton, Conn., has been appointed sales manager, and has been succeeded by E. Reaney.

A. Curry has been appointed production manager to succeed Ole Severson, now in charge of all development and research work.

H. Giller, formerly chief tool supervisor for Chrysler Corp., Detroit, has been appointed Detroit representative for the O. K. Tool Co., with headquarters at 5235 Buckingham avenue. He succeeds J. Costello, recently appointed assistant sales manager to contact with the machine tool trade.

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R. R. Wason has been elected president of Manning, Maxwell & Moore Inc., New York. He succeeds C. A. Moore, president of the company since April, 1927, who remains as chairman of the board. Mr. Wason will make his headquarters in the main office in New York.

Mr. Wason also was elected president of Consolidated Ashcroft Hancock Co. Inc., one of the subsidiaries of Manning, Maxwell & Moore Inc., manufacturing Ashcroft gauges, Hancock valves and American instruments at Bridgeport, Conn., and Boston.

Mr. Wason has had much to do with merchandising and management problems. For many years he was director of merchandising for Proctor & Collier Co., Cincinnati, where he worked on the problems of many large middle western manufacturers. Early in 1929 Mr. Wason went east to represent banking interests in the Clark Lighter Co.

Obituaries

JAMES L. WALDIE, 60, president and managing director, Canadian Tube & Steel Products Ltd., Montreal, Que., died Jan. 9. He started his steel experience as office boy with Montreal Rolling Mills Co. A natural inclination toward the financial brought frequent promtions. He became bookkeeper, cashier and then secretary, remaining in the latter position until 1910, when the company was absorbed into the Steel Co. of Canada Ltd. Although offered the position of secretary with the new company, he with others formed the Canadian Tube & Iron Co. in 1910. The next year a pipe mill and a bolt and nut plant were built, and in 1912 the Colonial Wire Mfg. Co. and Canadian Rolling Mills Co. were organized, Mr. Waldie becoming vice president and active head of both. When the president retired in 1920, Mr. Waldie merged the three interests and was elected president and managing director.

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Richard J. Murphy, 68, Exeter, Ont., district manager of the Massey-Harris Co., died Jan. 8.

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Edward P. Fitzgerald, 63, manager for 20 years of the South Boston office, Colonial Steel Co., Pittsburgh, with which interest he has been identified for 25 years, died Jan. 10 at his Boston home. He was born at Springfield, Mass., and served his company as salesman for five years before being appointed branch office manager.

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William S. Bartholomew, 66, retired vice president of Westinghouse Air Brake Co., Wilmerding, Pa., and retired president of Locomotive Stoker Co., Schenectady, N. Y., died Jan. 6 at Pittsburgh. He was associated with Westinghouse interests for 25 years, having retired in 1928. Mr. Bartholomew developed the mechanical locomotive stokers used in this country and abroad.

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Walter E. Nichols, who retired ten years ago as president of American Tap & Die Corp., Greenfield, Mass., died there Dec. 24. When ten years old he commenced to learn the cutlery business and by 1860 was a member of the firm of E. S. Hurlburt Co., Bernardston, Mass. In 1872 he returned to Greenfield with his brother, the late J. Henry Nichols and purchased the Greenfield Tool Co. In 1902 he began to manufacture threading tools in another plant and in 1905 he consolidated the two companies under the name of American Tap & Die Corp.

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J. Frank Stacey, 77, who for the past six months has been identified

(*Concluded on Page* 82)

Here and There in Industry

LACROSSE BOILER Co., La Crosse, Wis., has completed arrangements to manufacture and market the complete line of tractors and engines formerly produced by Townsend & Co., Janesville, Wis. R. C. Townsend of the latter organization will join the LaCrosse company. Manufacture of frames, tanks, radiators and wheels for these tractors has been carried on by the La Crosse company for 15 years, while assembly has been completed at Janesville.

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American Chain Co. Inc., Bridgeport, Conn., has moved its office at Boston from 132 High street to room 1214 Statler building.

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Federal Press Co., Elkhart, Ind., has appointed the Illinois National Supply Co., Indianapolis, its exclusive representative for Indiana.

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Schrock & Squires Inc., New York., steel merchant, has moved to its new and larger warehouse at 326-328 West Eleventh street.

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Cleveland headquarters of Empire Steel Corp., Mansfield, O., have been removed from 2002 to 2013 Union Trust building, Cleveland.

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W. W. Sly Mfg. Co., Cleveland, has moved its office at Springfield, Mass., from 44 Vernon street to 23 Kenwood terrace. C. F. Dunasky is district manager.

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Pennsylvania Engineering Works, New Castle, Pa., is making final shipment of three converters to the Jones & Laughlin Steel Co., Pittsburgh, for its South Side works.

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Davies & Thomas Co., founder and machinist, Catasauqua, Pa., has moved its New York offices to the Lincoln building 60 East Forty-second street.

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Tourtellotte-Bradley Mfg. Co., Seattle, has changed its name to Western Steel Products Co. Inc. Steel sash, window frames and other steel items are manufactured.

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Barnes Machine Works, Houston, Tex., has moved from 1009 Washington avenue to 4900 Navigation boulevard where it has completed a new plant. J. A. Barnes is president and manager.

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Gary Structural Steel Co. is the new name adopted by the Walter Bates Steel Corp., Gary, Ind. No change other than the name is made and the company's corporate structure or financial situation are unaltered.

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Kuhlman Car Works, Cleveland, a subsidiary of the J. G. Brill Co., Philadelphia, manufacturer of street cars and other vehicles, has changed its name to J. G. Brill Co. of Ohio. It has been under Brill ownership since 1905.

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Whitin Machine Works, Whitinsville, Mass., has completed negotiations for acquiring the Fales & Jenks Machine Co., Pawtucket, R. I., and the Woonsocket Machine and Press Co. Inc., Woonsocket, R. I. The concerns manufacture textile machinery.

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James Morrison Brass Co., Toronto, Ont., has made arrangements to take over production of locomotive steam specialties of the Sargent Co., Chicago, and of gages, instrument panels and radiator valves for the James P. Marsh Co., Chicago, for Canadian and British markets.

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Dunbar Engineering Co., 122 East Forty-second street, New York, has been made representative of the Edward Valve & Mfg. Co., East Chicago, Ind., for those portions of New Jersey, Pennsylvania, Delaware, Maryland and Virginia formerly handled from Philadelphia and Baltimore.

□ □ □

Latex Iron & Steel Co., Shreveport, La., has been taken over by J. B. Beaird Corp. of the same city. The steel foundry and equipment of former company has been consolidated with the Beaird Corp. plant at Cedar Grove, a suburb of Shreveport.

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Rothe Foundry Co., Green Bay, Wis., has just completed one of the largest single castings it has ever produced. It is the keel for a large pleasure yacht under construction by the Burgher Boat Co., Manitowoc, Wis. The keel casting is 33 feet long and weighs 26,000 pounds.

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International Harvester Co., Chicago, is further diversifying its tractor line by addition of two new models of the track-laying type. One model of 15 to 20 horsepower already is in production on a small scale, and production on the other model, a 15 to 30-horsepower size, will be started shortly. More than $2,000,000 is understood to have been spent by the company in developing the new models.

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Transformer Converter Co., Wisconsin Rapids, Wis., has been organized by I. W. Kureth and H. E. Patrick, formerly of Chicago, and W. F. Anderson of Wisconsin Rapids, to manufacture and market a new type of electric arc-welding machine which has been in development for three years. Patents are pending.

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General Welding Products Inc., St. Louis, has acquired a site in East St. Louis, Ill., on which a building containing 15,000 square feet will be utilized, with improvements and additions. Eventually the company expects to move its entire plant to the new location. It is a manufacturer of storage tanks and other products in which welding is widely employed.

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Gandy & Earp, 440 South Franklin street, Decatur, Ill., ornamental iron work, have become incorporated with $75,000 capital, succeeding the partnership heretofore existing. C. J. Gandy has been elected president and treasurer, L. S. Earp vice president and W. W. Ellison secretary. Directors consist of these officers and R. M. Gordon. O. A. Sanks and B. M. Constant.

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Porcelain Enamel Institute Inc. has been organized as a result of the meeting of manufacturers of this class of goods in Cleveland Nov. 6 and has established headquarters at 612 North Michigan avenue, Chicago, in the Michigan-Ohio building. Its aim will be to conduct market research, co-operate in publicity and seek out new products. George P. MacKnight has been made publicity director.

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Arthur G. McKee & Co., Cleveland, have established an eastern office at 120 Broadway, New York, which will be under direction of Walter G. Mortland, who has been active for many years in the iron, steel and oil industries at New York. The McKee company specializes in design and construction of iron and steel plants, petroleum refineries and general industrial construction in this country and abroad.

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Lester Die & Machine Co., Cleveland, recently incorporated to manufacture die-casting dies and to give engineering service in design of die-casting machines, has established its operations at Superior avenue and East Thirtieth street. Nathan Lester is president and treasurer, William Lester vice president, and F. W. McIntyre director. Machines of its design are to be manufactured and sold by the Reed-Prentice Corp., Worcester, Mass.

Fairchild Aerial Surveys

BEAMS FROM BROADWAY

NEW YORK

STEEL also has its night life. While at least part of New York sleeps, a steady stream of structural material moves by water from the New Jersey side to slips, either in the North or East rivers, which are handiest to the job.

Difficulties in storing structural steel on crowded Manhattan are insuperable, resulting in material moving to the job only as needed day by day. At Communipaw, Weehawken, Hoboken, Greenville and Jersey City co-operation between the railroads and the contractors enables steel to be received from the fabricating shops and to be dispatched to the jobs on Manhattan.

At these points, a representative of the erectors works with the railroads in sorting for derricks and floors. Lighterage to Manhattan is free, as are storage charges in Jersey yards for the first two days. After that, however, there is a storage charge of 55 cents a ton for the first 30 days and 6 cents a ton for the second 30 days. There is also a lift charge on the heavier pieces.

Steel Moving Is Night Job

In the case of subways, steel is more often stored near the job, especially in the outlying sections, although subway steel has been stored for months on Fulton street in busy lower Manhattan. Steel is generally scheduled to move from the Jersey side on a 24 to 48-hour basis as needed. One sees little steel moving about the streets of New York except late night or early morning.

A few exceptions in which steel moved direct to the job are the recently completed Hotel Pierre, the first section of the West Side elevated highway and a few heavy pieces for the new Waldorf-Astoria now under construction. Steel for the Hotel Pierre was fabricated at Pencoyd as needed for immediate erection and shipped direct. It was lightered, but not stored.

Central Heat New Factor

Impressive as is New York's skyline, it isn't as intricate as underground Manhattan. Under the exploited "sidewalks of New York," are myriads of steel and metal, pipe, wires, conduits, shapes, bars and what-not. An X-ray of subsurface Manhattan would reveal ever-changing wonders. In this under-surface network, influencing general construction, is central heating.

The New York Steam Corp. has more than 220,000 feet of steel pipe under Manhattan, serving scores of office buildings, manufacturing shops and apartments. This corporation has four main distributing steam units and one branch plant, divided in two districts, the downtown and uptown. Buildings as far north as Eighty-ninth street are served and the service is steadily expanding.

In Lower Manhattan, west side, central heating has a direct consideration in planning business structures. At 21 West street, the new 31-story office building has been erected without a basement. Some such structures just to the eastward go down five to six stories.

All steam for heating 21 West street is piped under Wall street from the central station at Burling slip and Water street. Twenty-four-inch steel mains carry the load. Pipe is heavily insulated to hold the heat in transmission. This building incidentally is served completely by utilities. Especially on Manhattan west side where land is generally "made" or filled, is this heating or steam pipe service practical.

Cost of foundations on such land is uncertain and high. Water is near the surface. Building schedules are often greatly hampered by going deep for space for a heating plant. The 35-story office structure built by the Gresham Construction Co. at 19 Rector street also has this New York Steam Corp. service. This building, however, further inland, has a basement. The New York Steam Corp. uses steel pipe from 8 to 24-inch. Heat volume is controlled by the meter-valve system.

Corner Columns Are Out

Cantilevered construction, by which steel corner columns are eliminated, is being employed in several apartment and office structures under way or about to start. This allows corner windows. Each floor is supported independently from the same corners of the floors above and below.

This construction has also been adopted for the Lehigh Valley freight terminal.

In this structure corner piers are not only eliminated but all outside support also will be averted by cantilevering floors out from interior columns, employing to some degree the umbrella idea. Starrett Bros. & Eken Inc. are erecting this structure.

In apartments the cantilever plan of steel construction is favored, especially for the corner window feature. The new Majestic apartments, now under way, and the 30-story apartment to be erected on the site of the Century theater, both Chanin

Construction Co. projects, will be cantilevered. A new apartment designed by Emery Roth at Central Park West and Ninety-second street will be built by the same method.

The 31-story office structure at 21 West street built by the Rheinstein Construction Co. is also cantilever, as is the office building erected by E. H. Faile & Co. on Madison avenue in the midtown section. The first structure in America in which corner columns were eliminated is said to be the Thorley building, 604 Fifth avenue, for which William Van Alen was the architect. He also designed the Chrysler building. The twin Beaux Arts apartments also have corner windows.

Hands Across the Hudson

Steel has met steel on the roadway for the Hudson river bridge. Laying of flooring steel from Fort Lee, N. J., to Riverside drive at 177th street, New York, is now under way. Dec. 29 girder steel met 250 feet over the Hudson river across a gap of 3500 feet, suspended from the giant cables which will hold the bridge. The job is well ahead of schedule. The bridge is due to be opened early in 1932.

The Port Authority of New York is also well ahead of schedule on the Bayonne-Staten Island steel arch bridge, scheduled to be opened late this year, although at first it was only hoped to make the grade in 1932. Girders for the runway are nearly complete on the Bayonne or Kill van Kull structure. Runway girders are set on the New Jersey side piers and well advanced on the Staten Island side piers.

It would appear the Port Authority has spurted ahead of the city in some details such as approaches to the Bayonne-Staten Island bridge, the longest steel arch span in the world. The Port Authority has an enviable reputation among contractors and steel men in pushing its projects ahead rapidly, a contrast to some public work. Incidentally, the inland freight terminal to be built by the Port Authority in lower Manhattan has reached the active stage, with wrecking under way.

◆

Seasonal variation in heavy construction work is less pronounced than several years ago. This is reflected in more even demand for structural steel and materials. While there are still seasonal trends in building activity, there is much more winter construction.

It is estimated that strictly seasonal fluctuation has been reduced to about 20 per cent, compared with 40 to 50 per cent ten years ago. This is directly due to modern equipment and methods and often need of rapid progress for economical reasons. Formerly the spurt generally was noted May 1. Now, when seasonal reasons must be taken into consideration, the Building Congress is urging that construction start March 1.

Another tendency is more rapid engineering, steel fabricating and erecting. The new 42-story building at Fortieth street and Madison avenue, taking 3500 tons, erected by the Taylor-Fichter Steel Construction Co. is an example. Dwight P. Robinson Co. is the contractor. Demolition of old structures on the site started June 21, excavation July 31, first steel Sept. 4 and first brick Oct. 3, being entirely bricked the last week in December for completion in April.

This fast building has a tendency to reduce the usual six to seven weeks allowed fabricators after taking plans, but fabricating plants in the East are well equipped to meet these speedier schedules.

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More than 80 skyscrapers 30 or more stories high have been erected on Manhattan, many only recently completed, and others are under construction. After ruling the skyline for 17 years, the Woolworth building, still considered by many the most beautiful building in New York, has given way to several in height, now being fifth. Here are some of the tallest:

	Stories	Height, feet
Empire State	85	1248
Chrysler	77	1030
Bank of Manhattan	72	927
Doherty building (now building)	63	.....
Woolworth	60	792
City Bank Farmers' Trust	59	.....
Salmon	58	698
Chanin	56	680
Lincoln	53	678

Many buildings vary widely compared by number of floors and actual feet in height.

Metal Windows Gain Favor

Use of metal windows has been increasing at the rate of 20 per cent annually. This is largely due to their adoption by large office and apartment buildings. In New York, fireproofing codes demand them.

Metal windows are made of steel, bronze and aluminum, steel leading by a wide margin. It is conservatively estimated 150,000 tons of sheet and strip steel and other metals are now used annually in the manufacture of metal windows. The average New York office building window, 4 x 7 feet, takes 200 pounds of steel and 50 pounds of cast iron in balance weights.

Windows for office buildings, as a rule, are made of cold-rolled strip, formed and welded, being galvanized after the window frame and sash is fabricated. Casement windows are more likely to be of hot-rolled strip or sheets. The average metal window, 4 x 7 feet, installed complete, costs about $35. This varies, but holds for the average.

Metal windows have always been favored by architects. Some metal windows have a radiator enclosure on the lower frame, which gives a panel effect to the interior. The heater in such an enclosure is located near the maximum point of radiation, near the glass.

Increased use of metal windows, at first limited because of cost, has been largely due to standardization on a production basis. They arrive on the job complete, ready for installation and one man can easily install as many in one day as five men assembling some of the older types.

Architects are making metal windows an actual part of the wall. In some New York buildings recently erected which have corner windows, weights are arranged on one side only. The Campbell Metal Window Corp. has completed installation in some of the largest buildings in New York. This company alone in 1930 sold and shipped windows taking more than 28,000 tons of steel and metal.

Flag Up on Most Projects

Flag is up over practically all the dozen new projects on lower Manhattan. Not only is the flag up in most cases, but brick or stone work is completed and interior work under way for opening in late spring.

The largest building now under construction in New York is the Doherty structure, Pearl and Pine streets, 63 stories. Three derricks operated by the Taylor-Fichter Steel Construction Co. are yanking steel up at the rate of a story a day. It hasn't made itself evident in the skyline yet, but will soon be a pronounced unit in the picture.

The new 24-story Stone & Webster building, 90 Broad street, is nearing completion, a notable engineering feat. About 7400 tons of structural steel went into the structure from the shops of McClintic-Marshall Co. This has been another fast fabricating and erecting job. Excavations started June 19 and smashed into the ledge, dreaded by all foundation builders, which runs near the surface in spots all the way up the west side of Manhattan.

The shovels struck solid rock, as did the foundation about a block to the north for the Marex building. Drills and blast mats, day and night, and the foundations were started Sept. 8. Steel hoists started Sept. 16.

The Stone & Webster organization will utilize five stories in this building and bank vaults will be in the basement for a branch of the Central Hanover Bank & Trust Co. A. L. Hartridge Co. is the general contractor, the building to be completed by May. George J. Atwell Co. did the foundations.

While structural steel and elevator

(*Concluded on Page* 46)

EDITORIAL

Present Situation Favors Small Plant Operator

MUCH has been said and printed extolling the virtues of mass production, continuous processes and automatic equipment. Many industries have installed efficient, and at the same time expensive, equipment for high-speed production of certain articles. Continuous sheet mills, automatic and continuous heat treating furnaces, continuous stamping production lines with high-speed conveyors, continuous assembly of many products, and numerous other modern devices of production are indicative of the direction in which large organizations have been moving in the last five years.

Mounting security prices and an unprecedented wave of prosperity with its attendant frenzy of buying and spending can take much of the credit for the wholesale automatization of production industries. Factory managers revised their ideas on production from thousands per month to thousands per day, and still sales departments called for more. Speed and more of it became the watchword.

A natural result of this trend was its effect on the small establishments where conveyors and automatic continuous equipment had not penetrated. These plants could not keep an equal footing with their larger competitors on either a price or production basis. Costs were higher and production time was longer. Their only talking point was quality and in many cases the slow and perhaps obsolete equipment of the small plant made even the quality feature difficult. And so these small plants struggled on, picking up an order here and there where customers' demands did not place too much of a burden on the plant's facilities. Their prosperity was a limited one; their production curve took no amazing leaps; their profits no spectacular increases.

Inevitable Reduction of Buyers' Needs a Blow to Mass Production

Then came the inevitable. Securities tumbled, buying slowed down to a walk, price structures wavered and the wheels of mass production smoked as the brakes were applied. More than one automatic continuous production line saw overhead costs mount up alarmingly as production demands dwindled.

Operation of an automatic line costs practically as much whether 100 or 5000 pieces are processed every hour. Consider a continuous heat treating furnace of the latest type designed for high production; fuel costs remain practically the same as long as a certain temperature must be maintained; interest on the investment certainly does not vary with production; electric power cost for conveyor drives is not reduced appreciably by smaller production; in fact the whole theory of high-production equipment is that the highest production involves the lowest costs. Hence when customers' requirements dropped from 100,000 a week or month to 10,000, costs of the continuous line jumped and a number of organizations operating these mechanical robots felt the pinch.

Readjustment Points Way to Opportunity for Small Producers

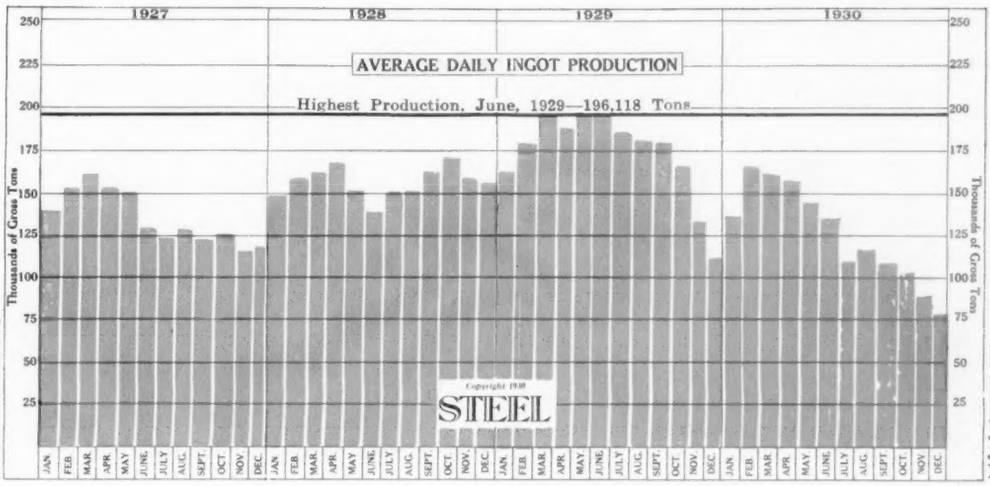
On the other hand the small plant with its slow but steady production, still picking up an order here and there, continued operations, being much less adversely affected by the business depression than some of their larger competitors. Costs in the small plant did not rise; rather they decreased due to lower raw material prices. Today in many localities the apparent incongruity is seen of the small plant with its noncontinuous and nonautomatic machines able to turn out an article at a lower price than its competitor with a large amount of capital tied up in high-production equipment geared to 1929 speeds.

This should not be construed as an argument against modernization of equipment. In many establishments the production problem calls for flexibility; in others the situation demands continuous and automatic equipment which yields its most profitable return when operating at full capacity. But in both cases the replacement of obsolete machinery by efficient modern equipment pays dividends.

The significant point in the present situation is the momentary advantage of alert and progressive small and medium-size plants over their larger less-flexible contemporaries. During the present period of reduced schedules the manufacturer with modest facilities has a chance to realize profits on his ability to be "quick on his feet."

The long-time trend of activity in the establishment of moderate size is likely to be a flat curve. It does not rise as much in time of prosperity or dip as low in time of depression as that of the large company. Therefore the present opportunity is one that should not be overlooked by those equipped to take advantage of it.

THE BUSINESS TREND



1929	Tons
Dec.	116,120
Nov.	135,116
Oct.	167,098
Sept.	181,119
Aug.	182,491
July	186,561
June	196,118
May	195,787

1930	Tons
Dec.	77,220
Nov.	89,379
Oct.	100,756
Sept.	110,307
Aug.	119,050
July	112,823
June	137,610
May	149,066

Business Moving Upward from December Low Point

AS THE statistical record for the old year approaches completion, confirmation of the low ebb of business during the final months is found in abundance. It now is evident that the downward trend of November extended into December, and if there was any difference in the two months it is found in the seasonal declines in the pre-holiday weeks at the end of the year. This slackening of activity was responsible for carrying the barometers for the twelfth month to unusually low levels.

Curtailment in the steel industry—evidenced by the recession in pig iron production to only 38.1 per cent of capacity in December—also is reflected in the monthly figures of steel ingot production compiled by the American Iron and Steel institute. The daily average for December was 77,222 tons, the lowest in any month since July, 1924, when the average was 72,223 tons. The daily average for the year, 127,500 tons, is the lowest since 1924 and compares with a 10-year average of 132,954 tons. Total production for 1930 amounted to 39,652,539 tons, which is slightly below 75 per cent of the record output of 1929.

STEEL'S Weekly Operating Rates Confirmed by Institute's Computed Figures

Now that the institute's figures for December are available, it is possible to check STEEL'S weekly compilation of steelworks operations. The institute's calculated figure for the month is 38.57 per cent of capacity. The average of STEEL'S four weekly compilations is 38 per cent. The following table shows the close agreement between STEEL'S weekly figures and the American Iron and Steel institute's computed monthly figures during the fourth quarter of 1930:

Issue of	STEEL'S Operating Rate per cent	American Iron and Steel Institute's Computed Rate per cent
Oct. 2	55	
Oct. 9	55-57	
Oct. 16	52	
Oct. 23	52	
Oct. 30	49	
STEEL'S average	52.8	50.32
November		
Nov. 6	45-48	
Nov. 13	44-46	
Nov. 20	43-45	
Nov. 27	43-45	
STEEL'S average	44.87	44.64
December		
Dec. 4	40	
Dec. 11	40	
Dec. 18	38	
Dec. 25	33-35	
STEEL'S average	38.00	38.57

Weekly Compilations Are Based Upon Checks in Seven Producing Centers

STEEL'S compilations are based upon a careful check-up of operations in the important producing centers. Each week its news correspondents at Pittsburgh, Chicago, Youngstown, Birmingham, Buffalo, Cleveland and eastern Pennsylvania compile an operating rate for the steelworks in their districts. On the basis of these seven individual operating rates the market editor of STEEL compiles an average for the entire industry. We believe that the results provide convincing evidence of the trustworthiness of this method of approximating the operating rate weekly.

Unfilled bookings of the United States Steel Corp. on the last day of December stood at 3,943,596 tons, an increase of about 300,000 tons. While the newspapers indicate that this gain is

being hailed in some quarters as a favorable indication, in reality it has little significance. Bookings usually turn upward in the final quarter and the gain in December, 1930, is no more than could be expected under the conditions which prevail today.

Employment figures for the country at large appear too late to be of much value, but those of certain industrial sections which are available for December indicate that slight gains were registered in some localities. However, it is likely that January will show a more general improvement than has been noted at any time in many months.

If this expected improvement materializes it will be due in part to resumption of operations in the automobile industry on a more liberal scale. If the estimate of the United States Automobile chamber of commerce is correct, the December, 1930, output will exceed that of December in 1929, a possibility which was hinted in these columns some time ago.

Automobile Output Due for Gradual Upswing in January

Automobile output during the first full week of January still was at a low rate, but with Ford under way beginning Jan. 12 and with other companies swinging into line, a gradual pick-up during the remaining weeks of January seems assured.

H. L. Braham, president H. L. Braham & Co., automobile finance, Cleveland, has made an interesting study of a phase of the automobile situation that has not received much attention. He declares that 1,000,000 cars, or three months' production of 1929, were carried over into 1930 for disposal. "Within the year of 1930 the 1,000,000 made and unsold in 1929 were marketed, together with the average in used car inventories, bringing us into 1931 with a subnormal supply of new cars in the hands of dealers, and used car stocks in a satisfactory position."

Continuing, Mr. Braham states that "in the year of 1930 there were 800,000 fewer cars scrapped and junked than in 1929. To be conservative this will call for at least 500,000 more cars manufactured in 1931 to meet the normal replacement market that was deferred in 1930."

Mr. Braham assumes that "it should be an assured fact that 1,000,000 more cars will be made in 1931, though the public does not buy one more car than in 1930, to take the place of the 1,000,000 cars that were made and unsold in 1929 that were sold in 1930."

Mr. Braham's analysis is given in greater detail on page 33 of this issue.

The record of commercial failures in December compiled by R. G. Dun & Co. presents a sorry picture of the effect of the present depression. The number of defaults mounted to 2525 and the amount involved to $83,683,361. The unfortunate feature of this showing is that in the 2525 failures are many companies which held on to the slender thread of life in the expectation that a turn in the business situation would save them. Many of them would have been much better off had they retired voluntarily six months or a year ago.

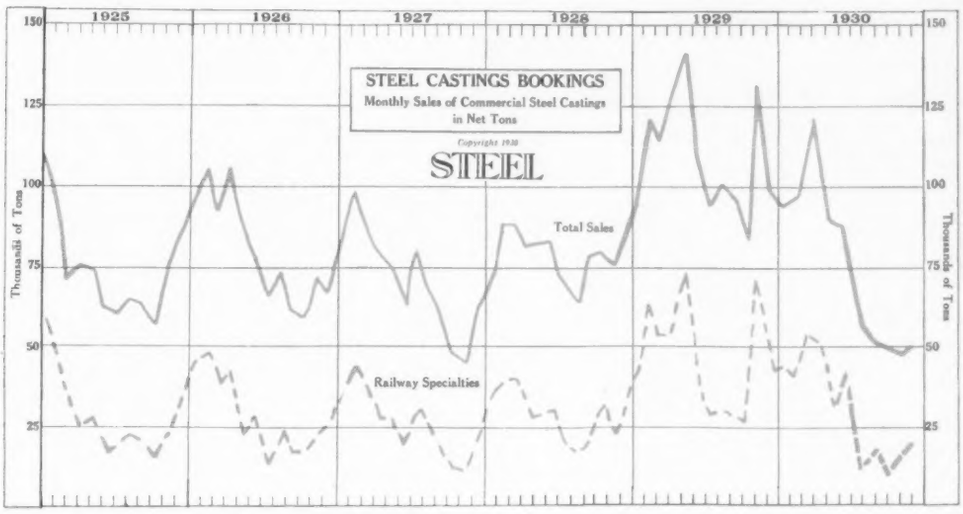
Decline in Commodity Prices Shows No Abatement in December

Commodity prices have been battered down to within striking distance of prewar levels. Bradstreet's index as of Jan. 1, 1931, stands at $9.51, the lowest point since Jan. 1, 1915, when the index registered $9.14. The extent of the decline in 1930 is indicated by the contrast in the figure for Jan. 1 of that year and the current index. A year ago the index was $11.68; today it is $9.51—a drop of 17.7 per cent in 12 months. The dip in December alone amounted to 3.2 per cent, indicating that previous signs of the imminence of stability were not trustworthy. Irving Fisher's commodity price index, which two months ago seemed to be flirting with stability, apparently gave it up as a hopeless job, for it has dropped almost 4 points in the last two months. These and other price indicators seem to indicate that when industry in September and early October made a pretense of recovery, its spurt was handicapped by a price situation from which hidden ingredients of inflation had not been squeezed.

STEEL's composite of 14 steel and iron prices continues unchanged at $31.66.

Carloadings in 1930 Were 13.3 Per Cent Under 1929 Total

Complete figures on revenue freight loadings show that volume in 1930 was only 13.3 per cent below that of 1929. This proportion is somewhat more encouraging than was expected in the mid-year of 1930 when current loadings were lagging as much as 20 per cent behind comparable figures for the preceding year. A glance at the chart shows that the gap between loadings of the two years increased from April until October, after which it narrowed slightly. Total loadings for 1930 were 45,887,413 cars, which compares with 52,827,825 in 1929 and 51,589,887 in 1928.



Total New Bookings

	Tons
November, 1930	47,862
October, 1930	45,552
November, 1929	97,888

Railway Specialties

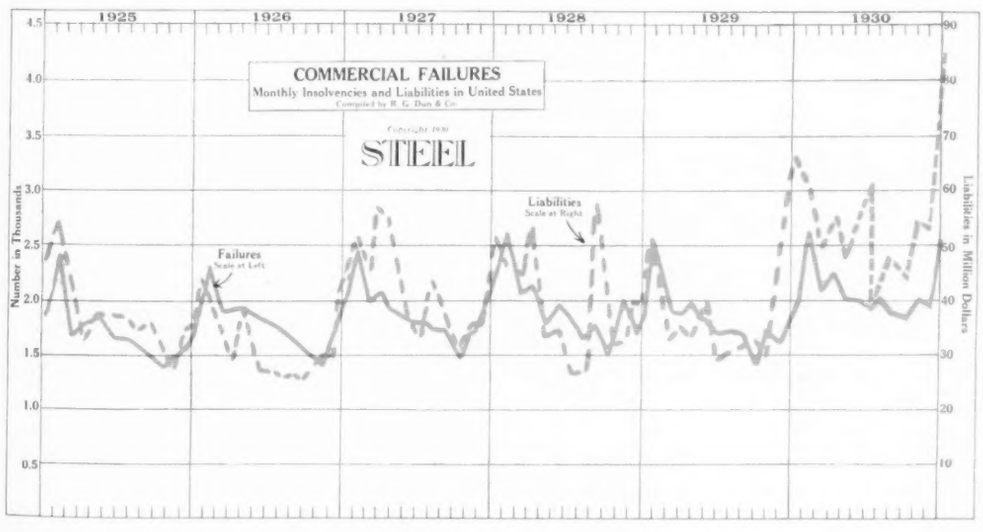
November, 1930	16,495
October, 1930	13,208
November, 1929	41,361

Orders for Commercial Steel Castings Halt Downward Trend

In November, for the first time since March, new orders for commercial steel castings made a gain. Bookings were for 47,862 tons, a slight increase over the 45,552 tons sold in October. Orders represented 33 per cent of capacity, as compared with 32 per cent in October and 67 per cent in November, 1929. Orders for railway specialties increased for the second successive time. In September they were for 11,148 tons or 17 per cent of capacity, in October they were for 13,208 tons or 20 per cent of capacity, and in November were for 16,495 tons or 25 per cent of capacity. Total production, at 31 per cent of capacity, is under bookings for the first time since March.

Liabilities Involved in Commercial Failures Set New Record

Commercial defaults in December reached a new high point in the amount of liabilities involved, according to the report of R. G. Dun & Co. Indebtedness of $83,683,361 on the part of 2525 business firms was the highest total on record except for March, 1924. Liabilities for November were $55,260,730 and in December, 1929 were $53,877,145. The number of failures compares with 2031 in November and 2037 in December, 1929, and is the highest since January, 1930. Failures of unusual size account for the greater increase in liabilities than in numbers. For the year 1930 liabilities amounted to $668,283,842, a record figure. The total of 26,355 failures in 1930 also is a record.

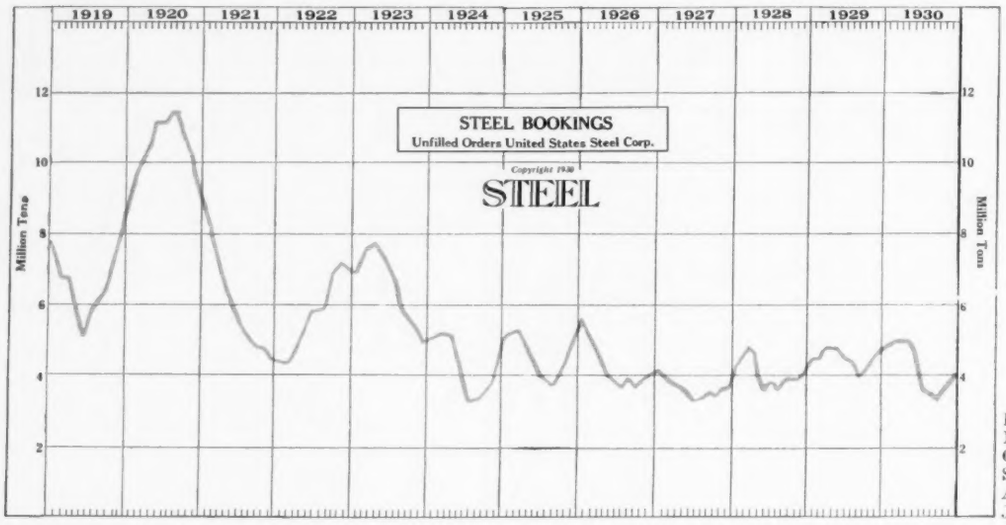


Liabilities

Dec., 1930	$83,683,361
Nov., 1930	55,260,730
Dec., 1929	53,877,145

Number

Dec., 1930	2,525
Nov., 1930	2,031
Dec., 1929	2,037



Thousand Tons

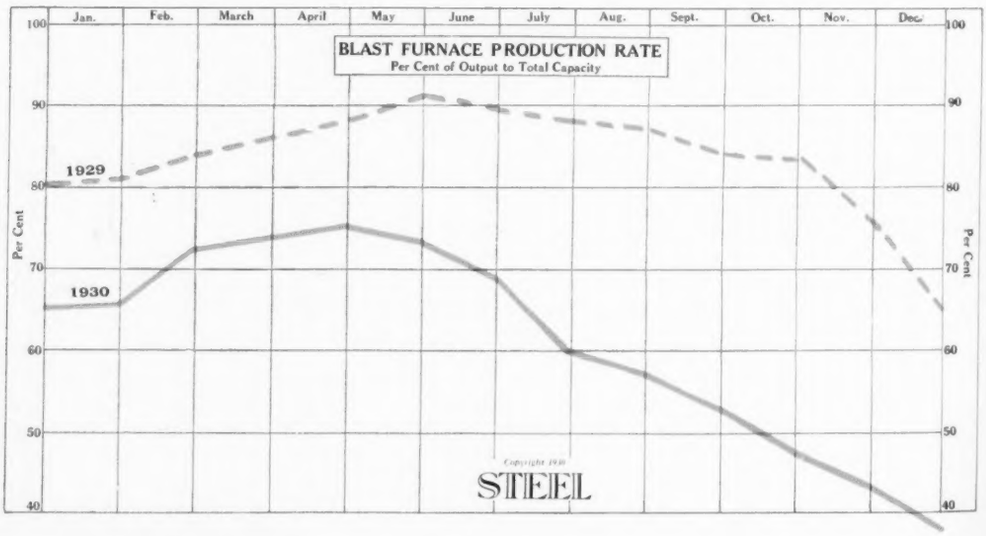
	1930	1929
Dec.	3,943	4,417
Nov.	3,639	4,125
Oct.	3,481	4,086
Sept.	3,424	3,902
Aug.	3,580	3,658
July	4,022	4,088

Steel Corporation Backlog Shows Substantial Gain

The United States Steel Corp. entered 1931 with its order backlog standing at 3,943,596 tons. The December increase of 303,960 tons was the third in succession, as October showed a gain of 57,425 tons and November a gain of 157,873 tons. Unfilled orders in December were well under those of December, 1929, when they were 4,417,193 tons. The gain at that time was 291,848 tons. In December, 1928, orders were for 3,976,712 tons. A little more than normal placement of orders at the end of the year was exhibited in December's gain, but a certain amount of consideration must be given to the effect of reduced operations upon the backlog.

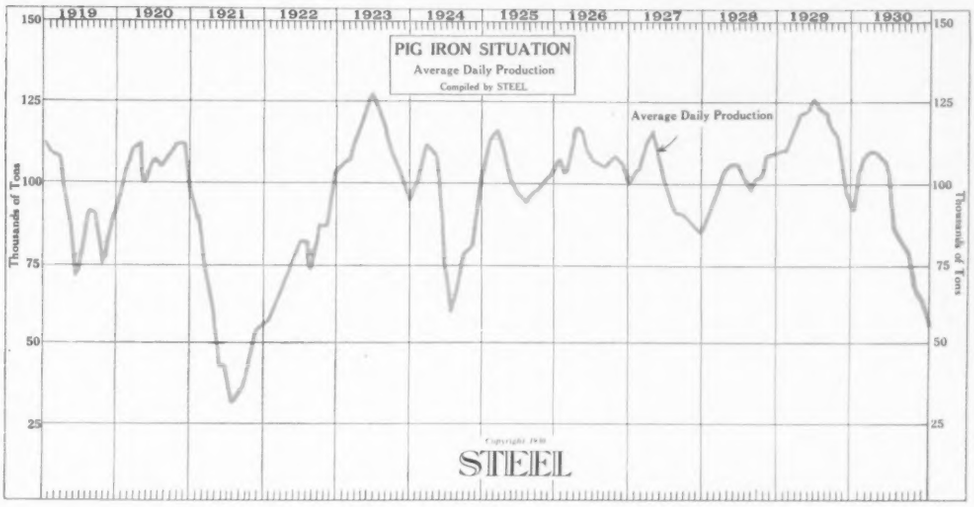
Reduction in Blast Furnace Rate Continues Unabated

The blast furnace production rate for December dipped to 38.1 per cent of capacity, according to the monthly report compiled by STEEL, following a drop from 49.6 per cent in October to 44.1 per cent in November. In the final months of 1929 and 1928 the rate was 65.5 per cent and 78.8 per cent, respectively. A net loss of eleven furnaces brought the number on the active list to 96 at the end of 1930, and production correspondingly fell to 1921 levels. Of the 310 furnaces available, the greatest number for the year were in operation during March, when 184 were producing. The most precipitous portion of the decline since that time was during the months of June and July.



Per Cent

	1930	1929
Dec.	38.1	65.5
Nov.	44.1	75.8
Oct.	49.6	82.6
Sept.	53.8	83.3
Aug.	57.8	86.4
July	60.3	87.2
June	69.3	88.5
May	74.2	89.8



	1930	1929
Dec.	53,730	91,513
Nov.	62,182	106,081
Oct.	69,851	115,747
Sept.	75,893	116,548
Aug.	81,455	120,845
July	85,110	122,016
June	97,817	123,837

Pig Iron Production Ends 1930 at Low Ebb

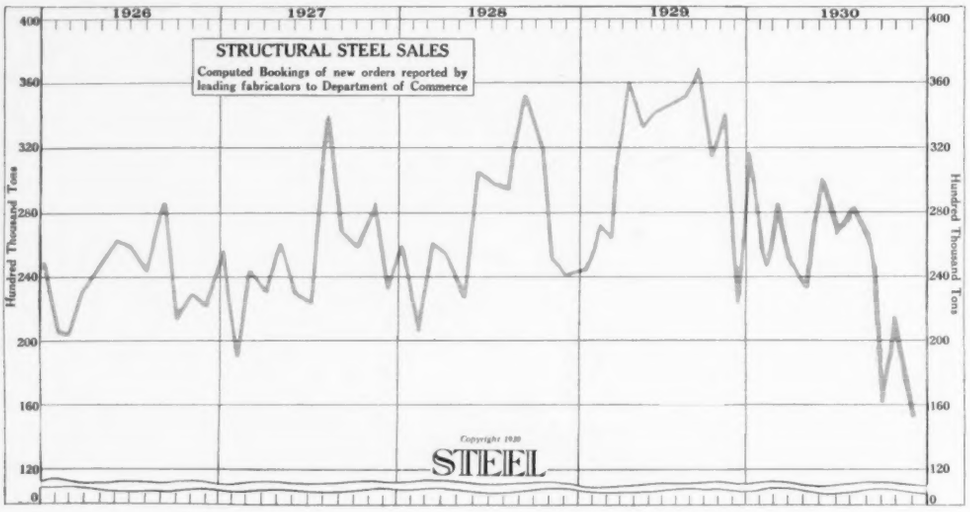
The extent of the curtailment of pig iron output is evident in comparisons of December daily average production, 53,730 tons, with production in previous periods. It is the lowest of any month since January, 1922; a reduction of 13.6 per cent from the rate of 62,182 tons in November, 1930; and with the exception of last July, exhibited the greatest tonnage drop since production began falling off in April. During the eight-month decline production has been reduced 49.5 per cent. Average daily production for the entire year of 1930 was 86,141 tons, as compared with 115,808 tons per day in 1929 and 103,365 tons per day during 1928. Total production of pig iron in 1930 was 31,441,403 gross tons, the smallest total since 1924.

Railroad Income Falls Off To Low Point

Net operating income of 171 class I railroads in November dropped to $62,069,000. Earnings were 28.3 per cent under November, 1929. Operating expenses, down 19.7 per cent, were more than matched by a decrease of 20.2 per cent in gross income. During 11 months of 1930 earnings were $834,510,000, which is 30.6 per cent under earnings of the same period of 1929. There was no substantial change from ten-month percentage comparisons. During the 11-month period operating expenses were cut 12.4 per cent but gross revenues fell off 15.7 per cent. With December figures estimated, the bureau of railway economics places net operating income for 1930 at $898,000,000, as compared with $1,275,000,000 in all of 1929.

Million Dollars

	1930	1929
Nov.	62.1	86.6
Oct.	112.3	152.9
Sept.	104.1	133.9
Aug.	95.6	141.7
July	82.7	122.8
June	68.8	105.8



	Tons 1930	1929
November	157,200	212,135
October	219,000	319,500
September	162,000	296,450
August	264,000	361,900
July	284,000	350,350
June	276,000	342,650
May	296,000	342,650

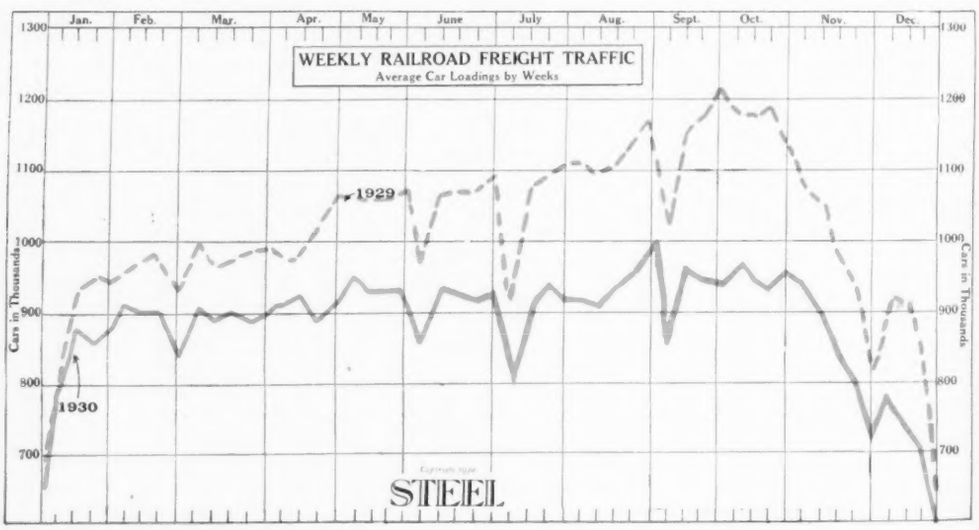
November Bookings of Structural Steel Break Sharply Downward

Structural steel sales in November dropped to 157,200 tons, the lowest point since November, 1922. The previous month, with 219,000 tons booked, had been a marked gain over the poor showing made in September, when 162,000 tons were ordered. November of 1929 also suffered a distinct recession, but the break took the total tonnage only as low as 212,135 tons. During the eleven months of 1930 2,657,400 tons were booked, as compared with 3,300,220 tons in eleven months of 1929; not since 1924 have totals for this period reached as low a point. Possibility that December figures will show an improvement is based upon the fact that preliminary construction statistics tend to indicate such a recovery.

Loadings of Revenue Freight Sustain More Than Holiday Losses

In the week ended Dec. 27 loadings of revenue freight totaled only 538,419 cars, more than a seasonal holiday decline. The total was 100,970 cars below the corresponding week of 1929 and even further under that of 1928. During the past year loadings at no time reached 1,000,000 cars per week. The peak was reached late in August, about one month earlier than usual. Total volume for the year was the lowest since 1922. Estimates of car needs for the first quarter of 1931 are based by shippers upon a decline of 5.5 per cent from the first quarter of 1930 and are placed at 6,568,456 cars, a substantial gain over the number in the last quarter of 1930.

1930	
Dec. 27	538,419
Dec. 20	713,810
Dec. 13	744,443
Dec. 6	787,173
Nov. 29	702,085
Nov. 22	779,757
1929	
Dec. 27	639,389
Dec. 20	842,775
Dec. 13	922,861
Dec. 6	936,825
Nov. 29	836,310
Nov. 22	949,716



How Carry-over of 1929 Motor Cars In 1930 Will Swell 1931 Demand

By H. L. BRAHAM
President, H. L. Braham & Co.

IN 1929, the automobile industry entered into a production program that carried with it the optimism of the time. Production was speeded up, apparently justified by the belief that more persons were in a position to own a car, and that a multiple of cars would be purchased for use by individual families. Toward the end of the third quarter overproduction became apparent, causing the common rumor within the trade that 15 months' production, or a three months' production beyond that which could be absorbed within the year, would be produced within 12 months.

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Million Cars Produced in 1929 Were Sold in 1930

After the market crash, this situation, if the statistics at hand are accurate, became an actuality, thus leaving the industry faced with the position of carrying an excess of three months' production of 1929 into the year of 1930, approximately 1,000,000 cars.

This abnormal number of cars carried into the year of 1930 naturally depressed the industry, but by the same token will go far to remedy its own position and stimulate all production in the year of 1931.

According to this analysis there were 1,000,000 more cars built in the year of 1929 than were absorbed by the ultimate consumer; the 50,000 dealers responsible for their sale within the year of 1929 naturally found, after pushing sales up to the greatest total in the history of the industry, that they were faced with the embarrassing position at the end of the year of carrying an unwieldly stock of both new and used cars, while factories were crowded with finished product plus tremendous inventories, all of which had to be absorbed before new commitments could be made.

With due credit to the manufacturers, they realized the position in which the industry was placed, and used the year of 1930 for readjustment.

Within the year of 1930 the 1,000,000 made and unsold in 1929 were marketed, together with the overage in used car inventories, bringing us into 1931 with a subnormal supply of new cars in the hands of dealers, and used car stocks in satisfactory position.

In the year of 1930 there were 800,000 fewer cars scrapped and junked than in 1929. To be conservative, this will call for at least 500,000 more cars manufactured in 1931 to meet the normal replacement market that was deferred in 1930.

It should be an assured fact that 1,000,000 more cars will be made in 1931, though the public does not buy one more car than in 1930, to take the place of the 1,000,000 cars that were made and unsold in 1929 that were sold in 1930.

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More Used Cars and More Gasoline Sold in 1930 than in 1929

There were more used cars sold in 1930 than were sold in 1929 and more gasoline was consumed in 1930 than in 1929, proving that there has been no actual decrease in the number of car owners.

So it should be a positive position that the factories can make 1,000,000 cars more in 1931, due to the inventories on hand in 1929 that were sold in 1930, and the assumption that they will have a demand for 500,000 more cars to take care of the replacement market that was deferred in 1930.

These 1,500,000 cars represent labor requirements beyond the requirements of 1930, and

should keep the automobile factories of the United States and Canada working at full time an additional four and one-half months. Their requirements for making this additional number of cars will cause them to make added commitments, of which the industry normally absorbs the following:

Commodity	Per cent of total production normally consumed by automobile industry
Finished rolled steel	18
Malleable iron castings	52
Gasoline	80
Rubber	84
Polished plate glass	73
Nickel	26
Lead	31
Upholstering leather	58
Hardwood lumber	17
Aluminum	37
Copper	15
Tin	23
Cotton grown in United States	10

Automobile Industry Is a Leading Employer of Labor

We are advised that more than 10 per cent of all the working people in the United States are employed in the automobile industry, not taking into consideration the number of people employed in the aforesaid subsidiary industries, or more than the total number of unemployed during the period of depression.

It is safe to assert that many other articles purchased on the deferred payment plan, such as radios, iceless refrigerators, furnaces, electrical supplies, etc., are in an approximate relative position.

1931 Demand Will Increase Even If No Improvement Is Noted

It therefore becomes apparent that if business did not improve in actual sales in 1931 over that of 1930, the manufacturers must of necessity manufacture in 1931 the entire overage carried by themselves and their dealers in the year of 1929, less the small stocks now in their inventory.

This industry will be further stimulated by the liquid position that the customer buying on the deferred payment plan now finds himself, as practically every account purchased in 1929 is now entirely liquidated, and deferred payment buying in 1930 was reduced by approximately 40 per cent in dollars and cents, and when we consider that about 85 per cent of the buying power has been unaffected, there should be many more potential customers for new cars in 1931.

By all laws of business economics, substantial recovery of business and employment should occur in the year of 1931.

"MAISON ISOTHERME," a type of steel frame house popular in France, embodying a steel framework, covered with metal lath to which concrete is applied. Below is a wall section used in the fifth type of steel house described in the article. Inner and outer walls are steel sheets, edges held together by vertical members which in turn are held rigid by horizontal tie pieces welded to them

Steel-Frame Residences Find Favor in France

BY VINCENT DELPORT
European Manager, STEEL

POSSIBILITIES of steel as a material for residence construction have been exploited to a limited extent in the United States, and results have suggested an annual market for 2,700,000 tons of fabricated structural products, based upon an average of 9 tons per residence. A number of steel-frame houses likewise have been built in Great Britain, France and Germany but at the present the expansion in use of steel for residential construction in Europe is not great, probably due to the fact that many consider the idea as still in the experimental stage. More definite conclusions as to the suitability of steel walls, partitions and floors with regard to the avoidance of noise, dampness and heat conductivity will be available a few years hence, in the opinion of European authorities.

Nevertheless, in France a number of types of steel houses have been designed, five of which have attracted particular attention. Details of these five types are presented with the object of affording the reader an idea of the principal characteristics of the steel house in France, as compared with this type of dwelling in the United States.

Each of the five types is known by a certain French name; the first is known as the design of Forges et Ateliers de Commentry-Oissel and in this design the frame is built up of steel, with walls and partitions made of slabs of a special mixture of cement. The frame consists of standard elements in the form of rectangular steel frames which are assembled by bolts. These frames have a width of about 1 meter (3.28 feet) and the height is that of one floor. Doors and windows must be designed to fit in with the standard frame which is light and can be lifted and put into place easily by one workman. The frames consist of two angles back to back and where doors and windows are to be placed it is necessary to add only a transverse bar, limiting the height of the opening. This

ANOTHER design of the "Maison Isotherme," the second type of steel house described, is shown at the left. Below is an interior view, revealing the characteristic simplicty and compactness of the French residence

type of construction limits the height of the house to two or three floors, without reinforcing lower members.

Blocks used to fill in the frames are of a standard size, 330 millimeters (13.2 inches) in length, 155 millimeters (6.2 inches) thick and weighing 66 pounds. It is claimed that these special concrete blocks, cellular in form, are from four to five times more impervious than the ordinary brick wall of the same thickness. Edges of the blocks are such that they can be assembled easily between themselves and with the frame, the finishing being done by means of rich mortar, with the result that the whole structure resembles one block.

A feature of this design is the ease with which the whole structure can be assembled, and the walls, both outside and inside, can be covered in the same manner as are plaster walls in wood-frame houses.

Second Method Described

A second type of house, the "Isotherme" house built by a process of R. Decourt, embodies a frame comprising a series of steel angles, about 4 meters (13 feet) apart, the height of these vertical angles being that of one floor. Similar horizontal angles are assembled to the vertical members and the sides of the frame are braced. On the horizontal sections are assembled intermediate vertical members which support door and window frames as well as floor joists and rafters.

Outer walls are formed by covering the framework with an expanded metal lath or steel reinforcing. About 5 centimeters (2 inches) from the outside of this reinforcing, shuttering is built up and cement applied in the intervening space against the steel lath material by means of a cement gun, with the result that when the outside forms are removed a reinforced concrete wall resembling stucco is obtained.

Inner walls may be constructed of a variety of materials such as cork, fiberboard, etc., with about 5 inches of space left between the outer and inner walls for circulation of air. Windows with this type of wall construction are usually of the sliding type and when opened slide into the space between the two walls, a space which also is convenient for concealing piping and conduits.

This "Isotherme" or uniform temperature system is adapted readily to the multistory construction and French builders do not find it entirely suitable for small houses since the erection takes considerable time,

Structural member employed in the fourth type of steel house described, a cellular box section beam devised by the Societe de Constructions Multicellulaires, H. C.

they preferring to use the method in the construction of commercial buildings. In contrast to the first method described, the "Isotherme" house cannot be fabricated in the shop and erected quickly on the site because of the necessity for building up outside forms and cutting the metal lath to fit the walls.

The third design is that of the Societe des Forges de Strasbourg and embodies both steel frame and steel walls. The frame is made up of steel angles assembled with bolts, the angles being assembled on a base consisting of a steel channel which is laid on a number of concrete blocks forming the foundations. The width of the house is usually divided in half by another steel channel and floor joists of steel are fastened between the outer channels and the channel in the center. Partitions, roof frames and other parts are assembled in advance in the fabricating shop, thus simplifying the details of erection.

Alloy Steel in Outer Walls

The outside of the house is covered with steel sheets made of special alloy steel containing copper and known as "Apso," a steel which has been found to have unusual resistance to atmospheric corrosion. These sheets receive a coat of a special protective material called "Minium" before being placed on the frame and once assembled are further coated with a corrosion-resistant paint and a color coat. These wall sheets are fabricated with a number of corrugations running vertically the length of the sheet which give a decorative aspect to the walls and in addition give greater rigidity to the sheets which are only 1 millimeter (about 19-gage) in thickness. The external appearance of a house of this type is shown in the illustration on the following page.

In view of the protection offered by the sheet steel exterior, it is claimed that the inside walls can be made of any one of a number of types of finishing material without any risk of dampness. The designer of the house, Forges de Strasbourg, recommends a special material known as "Calorite," made up in the form of sheets and consisting of wood fiber and cement. These sheets are

prepared in standard sizes and are assembled easily. When they are mounted on the interior wall a space is left between the outer sheet steel covering and the fiber-cement sheet, in which pipes and conduits can be placed. The insulating layer of air also helps to exclude dampness and cold.

This system is characterized by the rapidity and ease of assembling on the site where the house is to be built, since practically all elements of the house are assembled originally in the shop of the steel fabricator.

Composite Beams Used

The fourth design is that devised by Societe de Constructions Multicellulaires, H. C.; in this type of house the walls are made up of a series of steel box sections of corrugated sheets, the walls themselves thus supporting the weight of the upper part of the structure. The standard element, shown in an accompanying illustration, consists of a tubular-type beam made of two parallel sheets, 50 centimeters (about 20 inches) wide, 0.4 millimeter (about 27-gage) thick and spaced about 33 centimeters (13.2 inches) apart. These sheets are assembled by means of identical sheets which are placed in between in zigzag fashion, so that the transverse section of the composite beam is triangular. The sheets are assembled by electric welding and are corrugated to provide greater rigidity and facilitate expansion or contraction under changes of temperature.

As the name of the designer implies, the beams are in effect multicellular, the sides subsequently being closed by flat sheets. These elements are erected side by side, fabrication being done in the shop and the height calculated to allow for doors, windows, etc.

Special materials are provided to cover these cellular walls both inside and outside; the inside covering commonly being sawdust and a special binder; the outside being a complex mixture of cellulose, asbestos and silica, held together by a binding compound. These materials adhere readily to the metallic elements as a result of the corrugations of the sheets.

For the erection of the house each composite beam is fitted at its extremities with gussets, which enable similar elements to be assembled horizontally at the height of the floor. The foundations of the house are of concrete on which one of the special beams rests in a horizontal position; the sheets forming the sides of this beam have a width exceeding that of the beam itself, the extra width being provided to attach the vertical composite beams forming the walls. At each corner of the house the walls form a right-angle V-opening which is closed up or filled with reinforced concrete, the reinforcement being vertical round bars held together by angular sections. The floors and roof also are assembled with elements similar to those used in the walls.

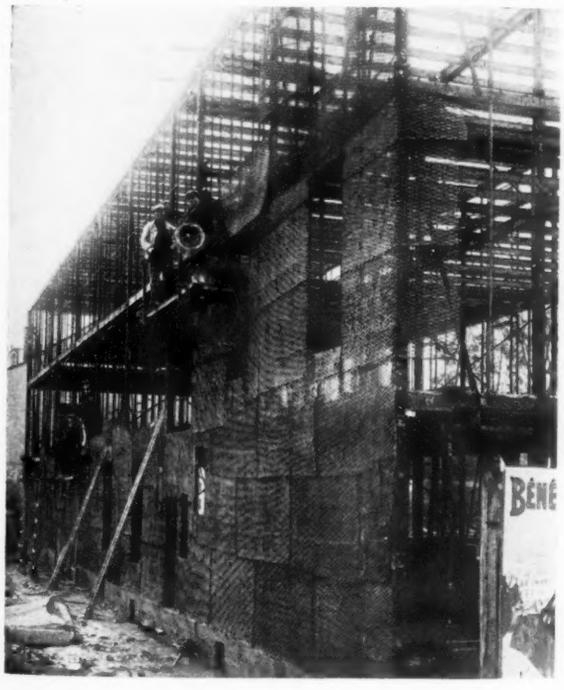
With this type of construction by far the greater part of the assembly work is done in the fabricating shop and considerable saving in time is effected in erecting the dwelling. The rigidity of the whole structure is such that houses can be built with several floors and of various designs. An interesting point is that the weight of these cellular beams is considerably less than that of the same size brick wall. The weight of 1 square meter (about 1.2 square yards) of these cellular beams is 15 kilograms (33 pounds), which is from 1/10 to 1/20 the weight per square meter of material generally used in the construction of houses.

Steel Plates Are Joined

The fifth and last design has been originated by Societe de Constructions Metalliques Fillod (Comefi) and employs a standard steel plate element about 50 centimeters (20 inches) wide and having a height equal to the height of one floor of the structure. The longitudinal edges of the sheets are bent back, forming an angle of about 60 degrees with the inner face of the sheet; two of these sheets are then placed next to each other and assembled by means of a special type of slit tube which slides down over the adjoining folded edges. These slit tubes

(Concluded on Page 42)

Steel house, the third type described in the article, designed by the Societe des Forges de Strasbourg. The exterior surface is made up of corrugated sheets of copper-bearing corrosion-resisting alloy steel



FASTENING metal lath to the steel framework of the "Maison Isotherme." When this material has been applied, forms are erected 2 inches from the lath and the intervening space filled with cement. When the cement is dry the forms are removed

Heat Treating Costs Assume New Role of Importance

BY J. H. G. WILLIAMS
Metallurgical Engineer, Henry Souther Engineering Co.

DUE to the economic pressure of the past year, business interests in general have conducted hard-boiled investigations of overhead expenses and burdens, with the idea of cost reduction; as a result, metallurgical departments have largely been on the defensive, and not always successfully. More than one elaborate installation of heat treating equipment installed in the "line" has developed a sore toe, since intermittent operation of a production line tends to increase rather than decrease the overhead expense of the automatic, press-the-button, furnace robot. It keeps right on consuming money. To process one article requires practically as much fuel as 10,000 similar articles. From this it may be inferred that the painful subject of costs, so forcibly illustrated to the metallurgist, will henceforth cause sharp discrimination between average production and peak production in his budgetary requests.

For a decade metallurgy has trespassed more or less in the field of design and, by the use of stronger alloys and laboratory heat treatments, essayed achievements in strength and lightness which more properly should have been solved by modified design of the part under consideration. Furthermore, consumers have been assailed with a flock of special steels possessing special advantages in limited applications. Ballyhoo and propaganda have pushed these steels into uses where actual experience has demonstrated that they possessed no advantages. In these aspects the year 1930 has witnessed a return to rationality.

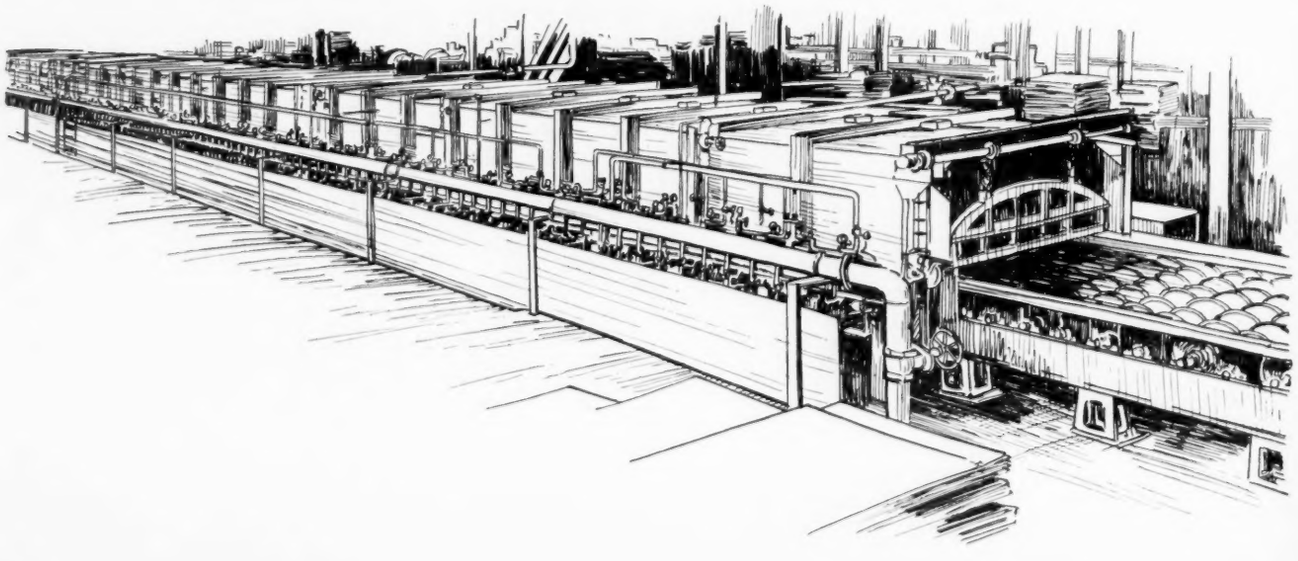
IN COMPILING the composite opinions dealing with progress in heat treating for 1930, appearing on Page 282 of the Yearbook of Industry issue of STEEL, Jan. 1, many comments were received which were worthy of considerably more space than could be devoted to them at the time. Among these valuable contributions, the accompanying remarks in regard to the past, present and future of various phases of heat treating, by J. H. G. Williams, metallurgical engineer, Henry Souther Engineering Co., Hartford, Conn., merit consideration.

Quietly a great amount of study and experiment has been made upon non-corrosive and heat-resisting steels despite the appearance of disquieting manifestations of unstableness under severe service conditions among some of the better known alloys in this group. New chromium combinations are being tried, a few have been patented and many more may be expected as a strong market demand exists for durable alloys of this type. One fact is evident, however, and that is that claims for merit will in the future be based upon long-time service tests and not upon enthusiasm. From now on fewer proprietary compositions will be applied in conditions of temperature, pressure and corrosion to which they are unsuited.

Special Equipment Devised

Heat treating equipment has undergone no marked changes, although interesting developments in special furnaces have appeared, noteworthy among which have been the adaption of the rotary-hearth furnace to forging practice; the introduction of continuous furnaces in sheet steel normalizing and annealing and of a semicontinuous-type furnace for nitriding work. Batch-type furnaces are pre-eminent in the general purpose field, and will continue to hold that position.

An interesting evolution is taking place among the fuels. The use of gas is increasing at a rapid rate, due largely to the movement to conserve waste of natural gas. During the year 1930 there have been started or projected some 12,000 additional miles of pipe lines to distribute this gas. Of the 38 states now using this fuel on an extensive basis 23 are dependent upon the remaining 15 states for their supply. Natural gas has reached the Atlantic seaboard; it is pumped from fields in Texas, Oklahoma, and Kansas to Chicago. Furthermore, byproduct gases from petroleum fields, such as butane and propane, are sold throughout the country, large scale distributing facilities for handling such gases hav-



ing been established in various localities.

Such developments reveal a demand and as a result of the accompanying study of gas equilibrium, under the various conditions of temperature and pressure, of partial reactions and of all the phenomena associated with combustion, changes in furnace design and metallurgical operations are bound to come. Already devices have appeared for mixing two or more gases of special composition in definite proportions with air for metallurgical purposes.

In the field of temperature control little change is noted. Rugged automatic equipment of reliability has been on the market for a number of years, and the present status of the art of heat treating requires no change of revolutionary nature.

Atmosphere Control Important

On the other hand, the question of furnace atmosphere and its control is agitated actively, and has received much study and publicity during the last year. Success has attended the use of hydrogen gas in normalizing and annealing operations. Special furnaces for these applications, with a relatively inexpensive source of supply of gas, are available commercially. It only remains to develop the necessary manipulative skill on the part of workmen to make the use of this type of furnace much more general.

The demand for atmospheric control in hardening operations is evidenced by the continued demand for information upon the subject of hardening super high-speed steel without a soft skin. This is not to imply that the solution of the problem rests entirely in the employment of special furnace atmospheres, but certainly the attempts to attain the objective center around their use, thus manifesting the interest in the atmospheric effect. From time to time old forgotten phenomena are rediscovered as, for instance, the fact that carbon concentration in the furnace atmosphere lowers the melting point of the steel being heated.

Gas curtains are supplied as regular equipment with some electrically heated heat treating furnaces and a variety of control regulators, none automatic however, has been placed on the market. Claims are made by the optimists that the grain size of steel for given conditions of heating exposure is a function of the surrounding atmosphere in the furnace. Out of all the turmoil something tangible and valuable will emerge.

Nitriding is settling down to business. It has found a secure field of application and is expanding gradually. Some bold work in the nitriding of heavy forgings is being conducted, while no doubt the more general application of the process is handicapped by the excessive time required. In the writer's opinion the greatest obstacle to the use of nitrided products is the price of the base metal used, and a downward revision would be productive of tremendous expansion of the market for such treatment. Some experimental work reported this year presents hopeful signs for a wide application of the nitriding process involving the use of catalytic materials such as magnesia or nitrided chips. Good nitriding has been accomplished in 4 hours and experimentally the process has been applied successfully to chrome-vanadium steels.

Coming events cast their shadows before. This year clouds have suppressed most of the portentous signs. However, the spasmodic appearance of probability curves would lead to the suspicion that uniformity of heat treated product is of prime importance, if not the greatest unsolved problem in heat treating.

Some form of hardness test is employed usually as the standard of uniformity. Service tests frequently reveal startling differences between the expected and actual performance and particularly does this hold true in the manufacture of small tools such as twist drills, taps, milling cutters and thread chasers. In spite of every effort to maintain constancy of composition, mechanical accuracy and heat treatment, the fact remains that performance records vary greatly, 200 per cent or more among apparently similar tools. Thus is it evident that much remains to be learned regarding uniformity, and that the present methods of testing to determine uniformity are not measuring the physical properties required.

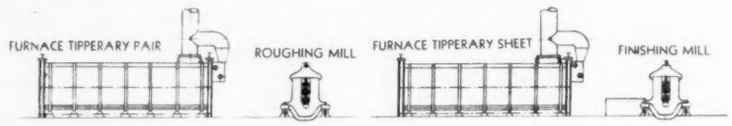
Ore Transfer Cars Are Equipped with Air-Heated Hoppers

ORE transfer cars with a holding capacity of 50 gross tons each, recently were placed in service at the Lackawanna division of the Bethlehem Steel Co., Lackawanna, N. Y., to serve trestle bins of various blast furnaces. The hopper of each car is equipped with a double lining with asbestos insulation on the exterior to permit hot air heating. This arrangement prevents the ore from sticking on the slope plates of the hopper in freezing weather. Heat is supplied by a small forced circulation coal heater mounted in the cab end of the car. The arrangement of the heating system is such that heat at the highest temperature is applied to the doors and thence around the body of the car, the outlet being taken from the top part of the car.

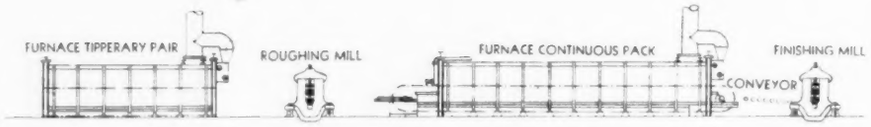
The car body is mounted on two special trucks equipped with roller bearing journals and supports the hopper. The latter is 10¾ feet wide and 20 feet long at the top and has a 4 x 9¾-foot opening at the bottom. Center discharge undercut gates, which are operated by a small motor located in the car body adjacent to the operator's cab, are provided. The total width of the car over the walks is about 14½ feet and the total height above the rails 12 feet.

Each end of the car is provided with a headlight and engine-type couplers. Next to the operator's cab a small stairway leads to a platform which surrounds the hopper on three sides. Equipment includes electrically-operated sanders on both trucks, hand-operated brakes on all four wheels and electrically-operated holding brakes on the armature shaft of the driving motors for parking purposes. The cars, designed to travel 10 to 12 miles an hour, were built by Wellman Engineering Co., Cleveland.

MODERN SHEET MILL METHODS



METHOD I — TIPPERARY—DOUBLE MILL SYSTEM

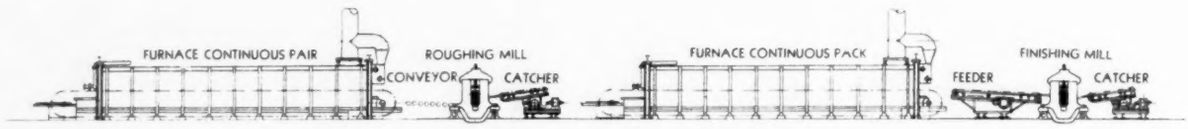


METHOD II — EQUIPMENT DIAGRAM

TIPPERARY ROUGHING SYSTEM — CONTINUOUS PACK FINISHING SYSTEM

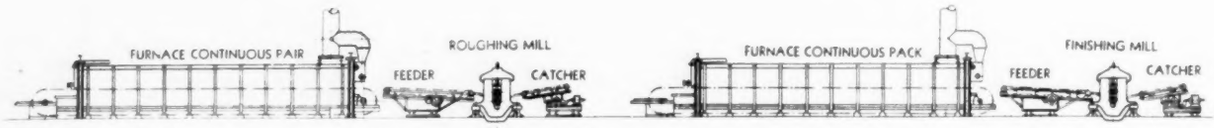
METHOD III — EQUIPMENT DIAGRAM

CONTINUOUS PAIR HEATING SYSTEM — CONTINUOUS PACK HEATING SYSTEM



METHOD IV — EQUIPMENT DIAGRAM

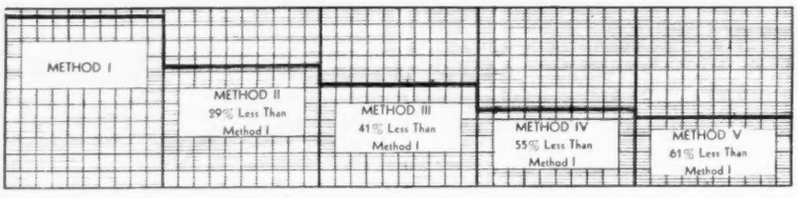
CONTINUOUS PAIR HEATING SYSTEM WITH MECHANICAL CATCHER — CONTINUOUS PACK FINISHING SYSTEM WITH MECHANICAL FEEDER AND CATCHER *



METHOD V — EQUIPMENT DIAGRAM

CONTINUOUS PAIR HEATING SYSTEM WITH MECHANICAL FEEDER AND CATCHER * — CONTINUOUS PACK HEATING SYSTEM WITH MECHANICAL FEEDER AND CATCHER *

* MECHANICAL FEEDER MADE POSSIBLE BY USE OF BREAKDOWN BAR, 14 TO 24 INCHES WIDE
ALL MILLS EQUIPPED WITH GEESEMAN-TYPE HOT MILL POLISHER



CURVE SHOWING COMPARATIVE HOT ROLLING LABOR CONVERSION COST FOR VARIOUS METHODS

New Sheet Rolling Method Reduces Conversion Cost

IN 1926 when the first wide strip mill was built to produce strip in sheet width, considerable conjecture resulted as to what would become of the conventional type mills then in existence because it was thought that a large amount of sheet tonnage would be produced by the continuous mills. However, investigation shows that in 1929, a high record of 5,886,000 net tons of black sheets was produced by the old-type sheet mills. Further study shows that in 1930 the production of sheets in the United States will be only about 32 per cent less than in 1929, whereas the estimated value of the product will be about 49 per cent less. It can be assumed that sheets already are being sold "ex continuous mills."

The problem facing owners of the approximately 700 hot sheet mills, which represent an approximate investment of $175,000,000, is how to compete with wide strip production and at the same time retain as many men as possible so as not to create a large technological unemployment.

New Layouts Developed

Considerable engineering effort has been devoted by leaders in the industry to solving this problem with the result that equipment and methods have been devised whereby this can be accomplished. The accompanying chart shows the gradual development and application of the various means employed to eliminate as much physical labor as possible from the actual production of sheets on the conventional type mill and to utilize efficiently the producing capacity of the equipment actually performing the rolling operation.

Whereas to some extent the equipment developed and applied is labor saving, to a greater degree it could be termed labor "aiding," in that the number of men actually eliminated from the crew is only about 30 per cent; the hard physical labor is removed from the balance of the crew to such an extent that production is increased, and lower cost results without decreasing earnings of the workmen. It is to be noted that earnings of the men on the crews will compare in any instance with those of similarly employed men on Method I which represents a conventional old style sheet mill unit.

None of the methods and equipment employed are untried but are all in actual operation and their utilization depends entirely upon the courage and vigor of executives in charge of the various sheet plants.

The development started with pack heating furnaces that would heat continuously at a higher rate of production with increased quality and discharge the material to the mill without physical labor. The large number of installations indicate that this has been accomplished in a satisfactory manner. The development of means for handling the product mechanically on both the roller's and catcher's sides of the mill created a condition whereby the slowest man on the crew no longer retards the mill output and permits the rolling operation with a minimum of physical labor. The application of the continuous hot mill polisher eliminates the necessity of stopping for roll polishing, which represents at least 15 per cent of the rolling time.

Units Used for Heating Bars

Furnaces identical to the pack heating furnaces have been introduced for pair heating to permit some of the same economies on the roughing mill as exist on the finishing mill when using pack heating furnaces. In addition, the pair furnaces have sufficient flexibility to permit the producer to purchase conventional bar, wide thin bar termed breakdown bar or plate-strip for breakdown purposes. These products are being heated in the same furnace depending upon which may be the most economical.

Method I shown in the illustration on page 40, depicts a layout for the rolling of sheets by the Tipperary or conventional style. Sheet bars are charged in and withdrawn from the pair heating furnace through the same door and when at the required temperature are rolled on the roughing stand to about 60 per cent of the finished length. After being matched the resultant packs are reheated in an in-and-out sheet furnace and rolled to the required gage and length on the finishing stand. In Method II the sheet bars are roughed down by the Tipperary system matched and then reheated in a continuous pack furnace. The packs are transferred from the reheating furnace to the finishing stand of rolls by a gravity-type conveyor instead of being handled by hand.

By heating the sheet bars in a continuous pair furnace, roughing them down, reheating the packs in a continuous pack furnace and rolling them to specified length, as shown in Method III, the labor conversion cost is 41 per cent less than with equipment involved in the Tipperary system. The sheet mill of the Newton Steel Co., Monroe, Mich., is laid out as shown in Method III. A larger saving is effected by using Method IV which involves a continuous pair and pack furnace, a mechanical catcher for the roughing mill and a mechanical feeder and catcher for the finishing stand. Method V is based on the use of breakdown bars 12 x 24 inches wide, the size and thickness depending entirely upon the finished gage and length of sheet required. The layout employing this method includes a continuous pair and pack furnace and a mechanical feeder and catcher for serving the roughing and finishing mills, such as are marketed by the Wean Engineering Co., Inc., Warren, O.

While it may be difficult for some of the producers, especially those producing light-gage black sheets or what commonly is called tight-rolled iron, to adjust themselves to new methods of rolling sheets on their existing equipment, they cannot disregard the obvious economies that can be secured. Sheet bar producers already are making provision to furnish breakdown bars to sheet mills employing these methods.

The cost curve indicated on the chart shows the decrease in hot mill costs when employing the various methods and any sheetmaker readily can determine the savings that can be effected in their plant by using their present hot mill cost as Method I and applying the percentage of saving. While the cost chart is not based on the production of tin plate, approximately similar economies can be effected. All of the equipment and methods involved are available under license to the entire industry.

Testing Group To Hold Regional Meeting

The second regional meeting of the American Society for Testing Materials is to be held at Hotel William Penn, Pittsburgh, March 18, at which time a comprehensive symposium on welding will be presented. The spring group committee meeting of the society also will be held in Pittsburgh during the week in which the regional meeting is held.

The technical program for the meeting will include the following: "The Quality of Materials for Welding," by F. N. Speller and C. R. Textor, National Tube Co., Lorain, O.; "Technical Examples of Modern Welding Practice," by A. M. Candy, general engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a contribution from the American Welding society; and "The Inspection and Testing of Welded Products," as related to fatigue and impact tests for welded connections, X-ray testing, magnetic testing, stethoscope examination of welded products, and practical inspection of finished welded products.

To Discuss Special Steels at Western Metal Congress

Figuratively taking apart a modern automobile, unit by unit, J. M. Watson, metallurgical engineer, Hupp Motor Car Corp., Detroit, president, American Society for Steel Treating, will describe before the Western Metal congress, St. Francis hotel, San Francisco, Feb. 16-18, the various types of steels that are being used in automobiles at the present time. Adaptability of special steels to serve a variety of purposes, and the number and types of different steels that can be put to the same duty will constitute a major portion of Mr. Watson's discussion.

Twelve technical societies are cooperating with the American Society for Steel Treating in plants for the congress and exposition. The groups are as follows: American Chemical society, American Institute of Electrical Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Welding society, Institute of Metals, National Association of Purchasing Agents, Pacific Coast Electrical association, Pacific Coast Gas association, Society of Automotive Engineers, American Society for Testing Materials, and National Association of Power Engineers.

Prominent among the papers to be delivered are: "Progress and Development of Fuel Fired Furnaces," by E. G. DeCoriolis, Surface Combustion Co., Toledo, O.; "Improvements in the Physical Characteristics in Large Carbon and Alloy Steel Castings," by J. Fenstermacher, Columbia Steel Corp., San Francisco; "The Formation and Elimination of Nonmetallic Inclusions in the Acid Open-Hearth Process," by C. H. Herty Jr., bureau of mines, Pittsburgh; "Electric Arc Welding," by A. F. Davis, Lincoln Electric Co., Cleveland; "Nitriding," by Dr. O. E. Harder, Battelle Memorial institute, Columbus, O.; and "Creep of Metals at Elevated Temperatures," by P. C. McVetty, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Plan Sales Discussion

"Possibilities of Increasing Sales of Oxygen Acetylene, Hydrogen and Gas Welding and Cutting Apparatus and Supplies During the Coming Year," will be the general subject for the annual meeting of the Gas Production association, at Sherman hotel, Chicago, Jan. 27-28. A feature of the program will be a series of actual demonstrations of correct sales presentations of these products to the customer. The purpose of this is to stimulate a more careful study of the requirements of the customer and to give an intelligent presentation of gas welding and cutting processes to the buyers. In following sessions of the meeting, special promotion methods for the industry will be discussed.

To Study Foundry Practice

A comprehensive study of steel foundry practice with a view to developing improvements and economies in practice and the improvement of the finished product is to be undertaken by Battelle Memorial institute, Columbus, O., under the sponsorship of Ohio Steel Foundry Co., Lima, O. Dr. C. H. Lorig, a member of the institute staff and a specialist in foundry practice, will be in charge of the work which is under the direction of Clyde E. Williams, assistant director of the institute.

Steel Founders To Meet

The annual meeting and election of officers of the Steel Founders' Society of America is to be held at Hotel Hollenden, Cleveland, Jan. 29. Other meetings recently announced by the society are sales clinic and regular meeting, Neil house, Columbus, O., March 19-20, and regular meeting, Pittsburgh, April 23.

Convention Calendar

Jan. 19-23—Society of Automotive Engineers. Annual meeting at Book-Cadillac hotel, Detroit. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary and general manager.

Jan. 27-28—Gas Products association. Annual midwinter meeting at Sherman hotel, Chicago. Kathryn Mims, 250 East Ontario street, Chicago, is secretary.

Jan. 29—Steel Founders' Society of America. Annual meeting at Hotel Hollenden, Cleveland. G. P. Rogers, 932 Graybar building, New York, is managing director.

Feb. 10-13—Mid-West Power Engineering Conference. Annual meeting at Chicago. G. E. Pfisterer, 308 West Washington street, Chicago, is secretary.

Feb. 16-20—American Society for Steel Treating. Semiannual meeting in conjunction with National Western Metal congress at St. Francis hotel, San Francisco, Calif. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Feb. 16-20—National Western Metal congress. Second biennial meeting at Civic auditorium, San Francisco, Calif. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Feb. 22-28—American Ceramic society. Annual exhibit and convention at Public auditorium, Cleveland. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

Feb. 22-28 — American Concrete institute. Annual meeting at Hotel Schroeder, Milwaukee. Harvey Whipple, 2970 West Grand boulevard, Chicago, is secretary.

Steel Residence Construction Finds Favor in France

(*Concluded from Page* 37)

are in elements of 30 centimeters (12 inches) in length. Walls comprise two sets of parallel sheets between which is a space for the circulation of air, the space often being filled with some impervious material such as sawdust. At intervals corresponding to the length of the tube elements, horizontal tubes or tie-pieces are assembled having a length equal to the distance between the two sheets, thus lending rigidity to the entire structure. Thus the complete element is formed by these assembled sheets in two parallel surfaces held together by the vertical tubes and strengthened by the horizontal tie-pieces.

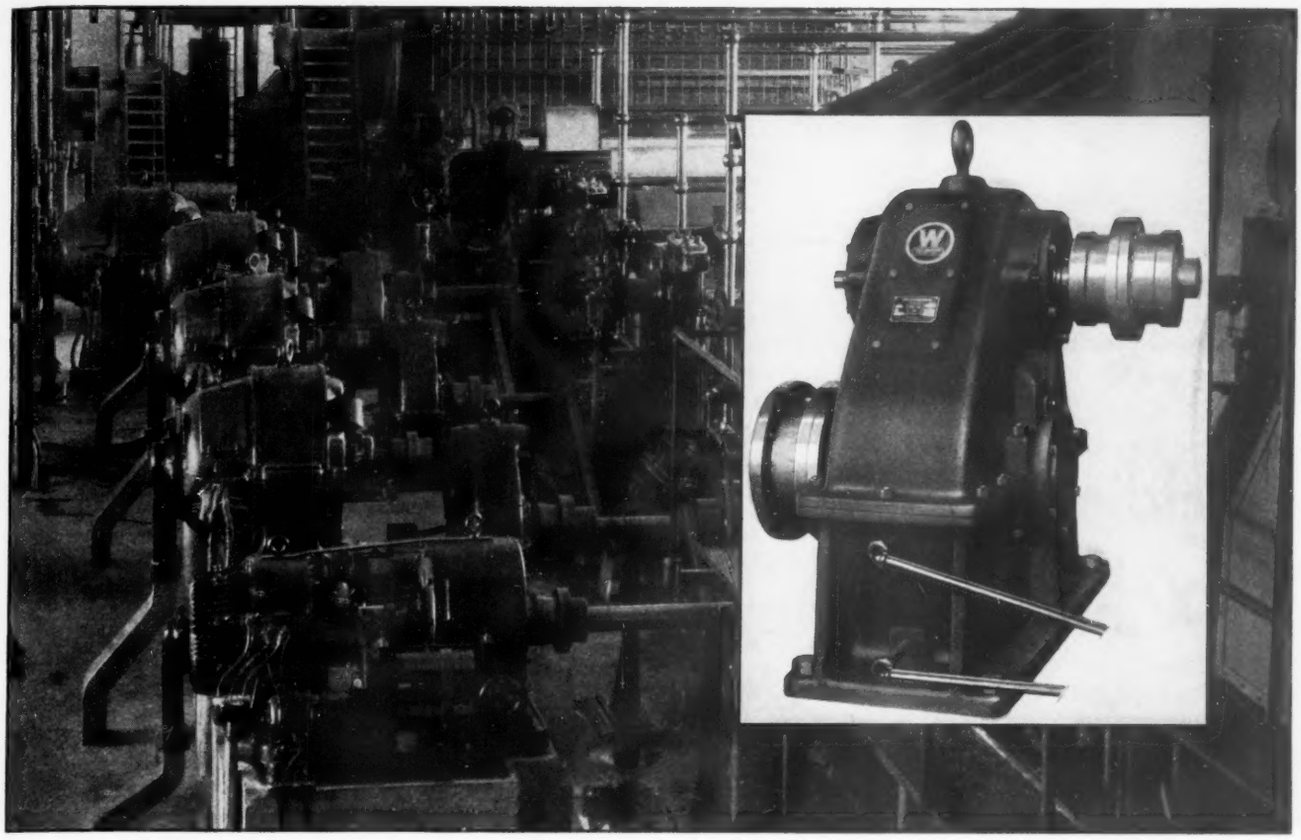
Walls and partitions are assembled to the concrete foundations by means of steel strips or angles. The roof is of sheet steel and is built in such a manner that in addition to furnishing protection it serves as a reservoir for rainwater. The various elements of the house can be assembled in the shop and taken to the site of the building where they are erected in short order. No rivets or bolts are required in the entire assembly.

This brief resume of the various types of steel houses erected in France during the last three years indicates the diversity of design, originality of construction methods and interesting applications which French builders have evidenced. It demonstrates also that the steel house, far from being merely an interesting novelty, is a type of construction which is perfectly sane and feasible, one which opens up amazing new possibilities for steel.

Standards Association Lists Recent Publications

American Standards association, 29 West Thirty-ninth street, New York, has issued a circular listing pamphlets on new engineering and industrial standards adopted up to Dec. 1, 1930. This circular gives the key number, title and price of published codes on 185 projects. Fields covered include civil engineering, mechanical engineering, electrical engineering, automobile and aircraft, transportation, ferrous metallurgy, nonferrous metallurgy, chemical industry, textile industry, mining, wood industry, and pulp and paper industry. There also are 41 miscellaneous items outside of these classifications.

The last page of the circular is given up to a general alphabetical index to A. S. A. standards, giving titles and key numbers. The new standards in every case deal with subjects of live industrial importance.



These Timken Bearings Have Run 70 Times the Life of the Average Automobile

The pinion bearings in the 6 Westinghouse-Nuttall gear reduction units at the Washington Pulp and Paper Company have each rolled up the enormous total of over 2,338,000,000 revolutions, and a recent check-up shows that they are good for many millions more.

Loaded 100% of their Timken catalogue rating, they have averaged 6¼ days per week, 24 hours a day since they were installed in April, 1923.

The total distance traveled by each of these bearings is the equivalent of driving an automobile more than 3,500,000 miles, whereas the average automobile travels but 50,000 miles during its entire life.

A worthy tribute to Timken stamina! Don't you want this same unequalled endurance in your mill roll necks, gear drives, pinion stands, hot saws, mill motors, cranes and every piece of equipment in your plant? The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN *Tapered Roller* **BEARINGS**

Fig. 1—Welded test drum with 1-inch steel shell after being subjected to hydrostatic test. Rupture did not take place

Welding of Pressure Vessels Is Winning Approval

BY J. C. HODGE
Babcock & Wilcox Co., Barberton, O.

CONSIDERATION of the service conditions under which welded pressure vessels, such as welded boiler drums for the generation of steam, reaction chambers and similar vessels in the oil refining industry, and special process equipment for the growing demands of the chemical engineer, will be called upon to operate, indicates that the welded joints must be of unquestionable quality, and that the properties of the joints must be at least equal in quality to the plate or base material from which the vessels are to be constructed.

To withstand the high temperatures and pressures of operation and sometimes peculiar ranges and cycles of temperature and pressure and to resist the effect of corrosion and corrosion fatigue, the welded joints should be free from major defects such as cracks, porosity, slag inclusion and incomplete fusion and should possess strength, ductility and resistance to repeated application of stress to a high degree. The chemistry of the weld metal should approximate that of the base metal as closely as possible.

Reliable Test Methods Needed

While large numbers of pressure vessels have been built to meet these conditions, and while a few manufacturers have been equipped for some time to produce high-quality welded joints, the general acceptance of welded pressure vessels has not been sanctioned in the past, principally because of the absence of a suitable and reliable testing procedure. In view of this, the greatest advancement in the field of welded pressure vessels in the past year has been the formation of tentative codes governing the fusion welding of boiler drums and unfired pressure vessels by the boiler code committee of the American Society of Mechanical Engineers.

Briefly, the proposed code is a testing code rather than a welding procedure code; that is, the code stresses the testing of the finished welded joints to determine their physical properties and soundness in preference to specifying an elaborate procedure to be followed in the deposition of the weld metal. A concise and definite code is the result rather than a complicated and indefinite welding procedure code. The proposed code is made up of three fundamentals:

1. Determination of the properties of the welded joints on representative test specimens.
2. Nondestructive examination of all main welded seams by X-ray examination.
3. Hydrostatic testing of the finished welded drums.

This code was drawn up for steam boiler drums, as well as fusion welded pressure vessels for the oil and chemical industries, regardless of what base metal is used in construction of the vessel. For alloy structural and corrosion-resisting steels as base metals for welded pressure vessels, the specifications of the code need only be changed in degree to conform to the particular physical and chemical properties of the base metal.

Alloy Steels Are Welded

It should be mentioned at this point that during the past year the use of corrosion-resisting steels has been extended and it is gratifying to note that the welded construction of these steels in process equipment has kept pace with this expansion. Indeed, the weldability of an alloy is invariably an important consideration in its adoption for process equipment.

Of maximum importance in progress of fusion welding of pressure vessels is the acceptance by the bureau of engineers of the United States navy of welded construction for the joints of drums of 24 boilers now being built by the Babcock & Wilcox Co. for the three new scout cruisers MINNEAPOLIS, NEW ORLEANS and ASTORIA. The specifications under which these boiler drums are being welded are a modified form of the proposed code of the boiler code committee. The adoption

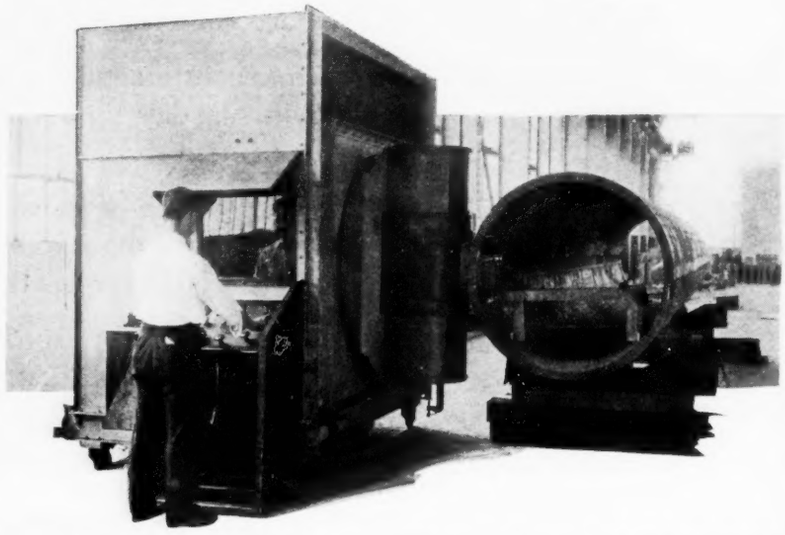


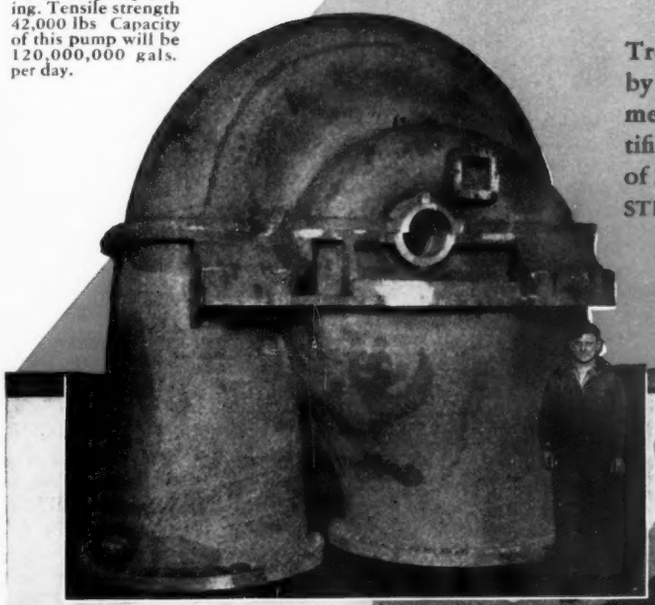
Fig. 2—Exploring the welded seam of a steel shell 30 feet long and 2¼-inch wall thickness by X-ray. As will be noted, the X-ray equipment is portable

TREADWELL

HI-TEST IRON CASTINGS

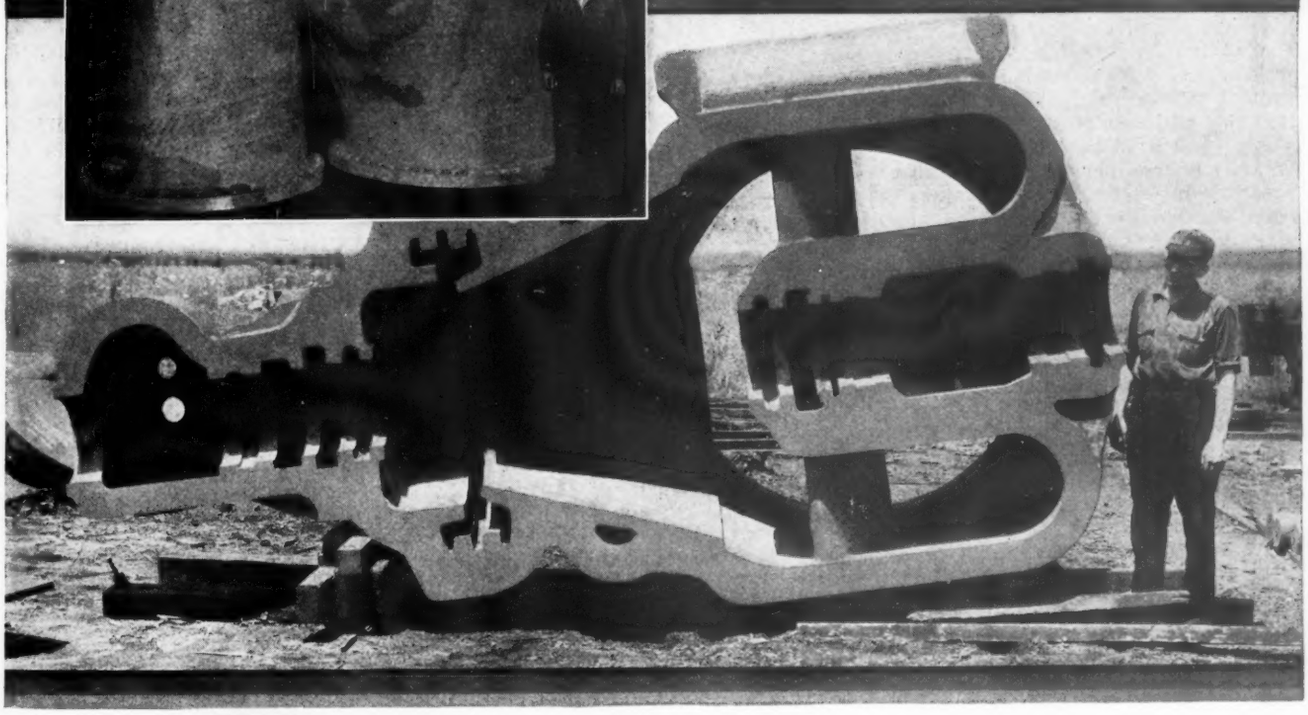
CASTINGS of TREADWELL HI-TEST IRON are being rapidly adopted for many purposes. Manufacturers are carefully analyzing the service requirements of each casting, and wherever possible, substituting this efficient iron which is readily machinable in place of more expensive metal. Treadwell engineers will be glad to assist in adapting HI-TEST to your needs.

TREADWELL Hi-Test Iron pump casing. Tensile strength 42,000 lbs Capacity of this pump will be 120,000,000 gals. per day.



Treadwell Casting Service—backed by the most modern foundry equipment and practice including scientific sand control—includes castings of IRON—HI-TEST IRON—ELECTRIC STEEL and ALLOY STEEL.

HI-TEST IRON Lower Turbine Casing Weight 23,195 lbs.
Tensile Strength 42,000 lbs.



BETTER GRADE MACHINERY

Treadwell Engineering Company

Easton, Pa.

Rolling Mills—Threading & Cutting-Off Machinery—Special Machinery—Iron & Steel Castings

of welding for boiler drum construction by the engineers of the navy can only be considered as the prelude to the general acceptance of welded pressure vessels of all types, in which the acceptance of the vessel will be based on a code, similar to the present proposed code.

Fig. 1 shows a welded test drum 47⅛ inches outside diameter, 1-inch thick steel shell and 14 feet 1 inch overall length, after being subjected to hydrostatic test. This drum, of the same general type construction as that used in the boiler drums, possessed one longitudinal welded seam and two circumferential or girth welded seams for the attachment of the heads to the shell. The welds were of the same thickness as the plate, for example, all excess weld metal had been chipped and ground off flush with the plate. During the hydrostatic test the drum was subjected 14 times to a pressure of 2830 pounds per square inch, the pressure in each case being raised from atmospheric. Rupture did not take place.

Based on a factor of safety of 5 and considering that the plate material had an ultimate tensile strength of 55,000 pounds per square inch, according to the formulas of the A. S. M. E. boiler code, the working pressure of the shell is 489 pounds per square inch, and the working pressure of the manhead is 487 pounds per square inch. The thickness of the manhead is 2⅛ inches. Assuming that the yield point of the plate material was 33,000 pounds per square inch, the pressure at which the yield point of the shell was reached was 1021 pounds per square inch. The maximum test pressure of 2830 pounds corresponded to a maximum hoop stress in the shell of 63,450 pounds per square inch, based on the original diameter of the shell and corresponded to 69,864 pounds per square inch based on the final diameter of the shell.

A straightedge placed on top of the drum to show the expansion of the shell demonstrated that the drum did not expand materially at the head because of the thickness of the head and the fact that the heads had a reinforcing effect on the ends of the shell. Previous to the hydrostatic test the drum had been stress relieved at a temperature of 1200 degrees Fahr. and the welded seam had been subjected to X-ray examination. A difference of 2 3/16 inches was measured between the straightedge representing the final diameter of the shell and the surface of the head representing the original diameter of the drum. Previous to the hydrostatic test, the drum was partially coated with whitewash, so that the pressure at which yielding of the plate took place could be ascertained.

In Fig. 3 is shown an arc-welded shell 49 inches long, 42 inches inside diameter, and 2-inch thick shell with one longitudinal seam. This drum was subjected to fatigue test and has withstood over 2,000,000 applications of internal pressure, each application of pressure corresponding to a cycle of stress in the plate of from 0 to 16,500 pounds per square inch maximum in tension, and in addition has withstood 34,400 applications, each application of pressure corresponding to a cycle of stress of from 0 to 22,000 pounds per square inch.

Fig. 2 shows the arrangement for the X-ray examination of welded pressure vessels. In this particular case, the welded joint in a shell 30 feet long, 48 inches diameter and 2¼-inch wall thickness is being explored by the X-ray method. The main longitudinal and circumferential welded joints of production pressure vessels are subjected to X-ray examination, which gives a true and accurate picture of the absence and extent of any defects.

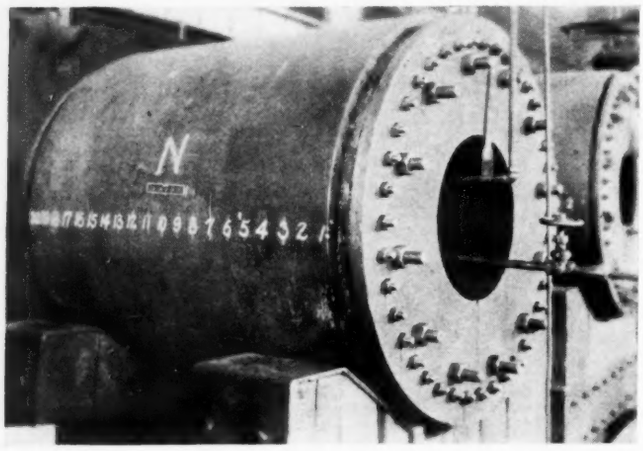


Fig. 3 — This arc-welded shell 49 inches long, 42 inches diameter and 2-inch shell withstood a fatigue test of over 2,000,000 applications of internal pressure

Beams from Broadway

(*Concluded from Page 25*)

engineering make the modern skyscraper possible, it is the elevator that limits and often fixes the height of the structure. This was true especially in fixing the final height of the Empire State building. Elevator engineers agreed that 80 to 85 stories was the feasible limit for the structure on a spot of such size.

Among elevator builders, interesting engineering developments are underway. Transportation is a big problem, emptying and filling giant structures quickly and smoothly. Experiments are being held with the operation of two elevators in one shaft. The two cars are operated independently, the approach of one to the other being automatically controlled by an electric differential.

Some engineers are studying the double-deck car plan. In the two-cars-in-a-shaft idea which has been tried in an experimental way, several new inventions are employed, including the automatic electric control of distance between the cars and a new automatic device for safety, halting a car out of control after a fall of a few feet.

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Sprinkler system in the new union freight terminal to be erected by the Port of New York Authority will take 500 tons of steel pipe. There will be 30,000 sprinkler heads. It is estimated that 2000 tons of steel pipe will go into the building for heating, plumbing and other needs.

Already under way is the Lehigh Valley warehouse, Starrett Bros. & Eken, general contractors. In this structure the sprinkler system alone takes 300 tons of pipe. There are 19,000 sprinkler heads supplied by the Grinnell Co. National Tube Co. is supplying the steel pipe for the sprinkler system, heating and plumbing, well over 1000 tons in all.

Research Reports Effects of Furnace Gases

Tests conducted by the engineering experiment station of the University of Illinois, Urbana, Ill., have shown that sheet steel ground coats and cover coats are affected adversely by small amounts of sulphur dioxide in the furnace atmosphere. The research, reported in Bulletin No. 214, "The Effect of Furnace Gases on the Quality of Enamels for Sheet Steel," by Andrew I. Andrews and Emanuel A. Hertzell, of the university ceramics department, indicates further that the composition of sheet steel cover coats has an important bearing on their resistance to sulphur attack. Oxygen is a necessary constitutent of the furnace atmosphere if an enamel of the best quality is to be obtained.

Approximately 800 tons of steel castings for refrigerator car underframes for Northern Pacific railway will be furnished by Pacific Car & Foundry Co., Seattle.

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Alloys for Gray Iron

Application of alloys in the foundry industry by E. K. Smith and H. C. Aufderhaar, in Iron Age, Nov. 27, p. 1583, 5 pp., 3 illusts.

Authors feel safe in stating that alloy cast iron is in its infancy, technically and commercially. Alloy steel did not really come into its own until the austenitic steels were developed and in a precisely parallel manner much work is being done at present toward the development of austenitic gray irons.

The literature on this subject is so voluminous and widely dispersed as to make it impractical for the busy foundryman to obtain quickly the published information on any given alloy. This paper is an attempt to give that information. In many cases data are incomplete as only preliminary investigations have been made. In some instances, investigations are now under way, and the results are not yet available.

—STEEL 1-15-31

FABRICATION:

Bronze-Welding

The progress of bronze-welding as used in making joints in nearly all ferrous and nonferrous metals, described by DeW. Endicott, in Journal of American Welding society, November 1930, p. 32, 13 pp., 12 illusts.

Bronze-welding is extensively used today both in repair and production operations. It is used in three general ways; for producing joints in metals with a higher melting point than bronze, which includes nearly all commercial metals; for building up worn surfaces; and for making fusion welds in bronze itself. The bronze-welded joint made in cast iron is the most familiar application of this process. This application is especially advantageous as the joint can be made quickly with the application of little heat. In bronze-welding cast iron general preheating in a furnace seldom is necessary. The description and results of a number of actual uses of the process is given as is also the method of application for cast iron, malleable iron, steel, wrought iron, galvanized iron, copper, brass and bronze. Bronze-welding should not be confused with brazing, although the process is somewhat similar.

—STEEL 1-15-31

PRODUCTION:

Diffusion in Metallurgy

Thermodiffusion of elements in steel, discussed by J. H. Hruska, in Heat Treating and Forging, November 1930, p. 1397, 5 pp., 8 illusts.

During the last few years applied thermodiffusion of various elements into iron and steel has created a steadily increasing and broadening branch of the metallurgical industries and although the actual mechanism of diffusion is still in the hypothetical state to the modern metallurgical world, progress may be noted in the practical development of new methods, new possibilities and new applications of this phenomenon which have been developed recently.

Studies conducted within the various groups of applied diffusion in metallurgy reveal, so far, a mathematical relationship of the percentage of most of the migrating elements and the resulting depth of penetration.

Considerable metallurgical, chemical and mathematical research work will have to be carried out in the future to prove the general correctness of these findings. However, all diffusions of chemical elements so far examined by the previously mentioned method of mathematics were successful and the only differences noticeable were due to the mass of the treated stock or specimens or to the grade of the steel utilized in the experiments.

—STEEL 1-15-31

MISCELLANEOUS:

Die Casting

Progress of the die casting industry, described by Marc Stern, in Transactions and Bulletin of the American Foundrymen's association, December 1930, p. 723, 14 pp., 3 illusts.

Die casting is defined and its relation to a slush casting, permanent-mold casting, centrifugal casting and pressed casting is carefully pointed out, because of the tendency to confuse some of these terms. Early haphazard alloying methods which were responsible for unstable alloys are discussed, and contrasted with the progress made since the subject received scientific investigation. On the subject of dies, the importance of gating, venting and water cooling is pointed out. Air and plunger types of casting machines are illustrated, and progress traced up to the modern automatic casting machines capable of producing even complicated die castings at the rate of over seven operations per minute.

—STEEL 1-15-31

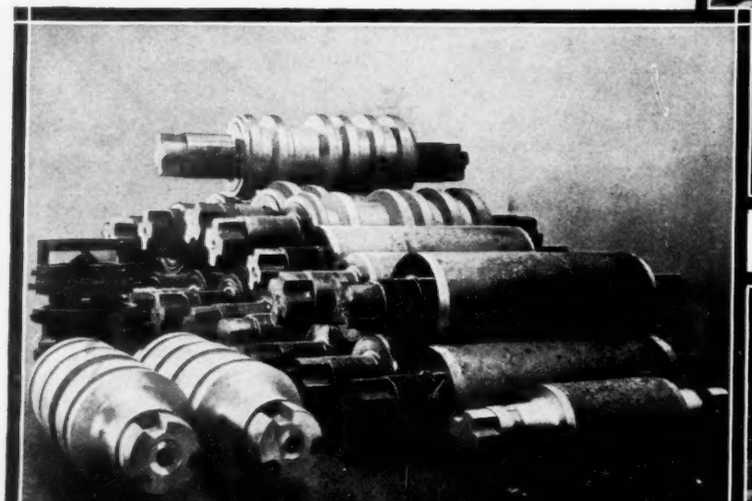
Ultra-Violet Rays

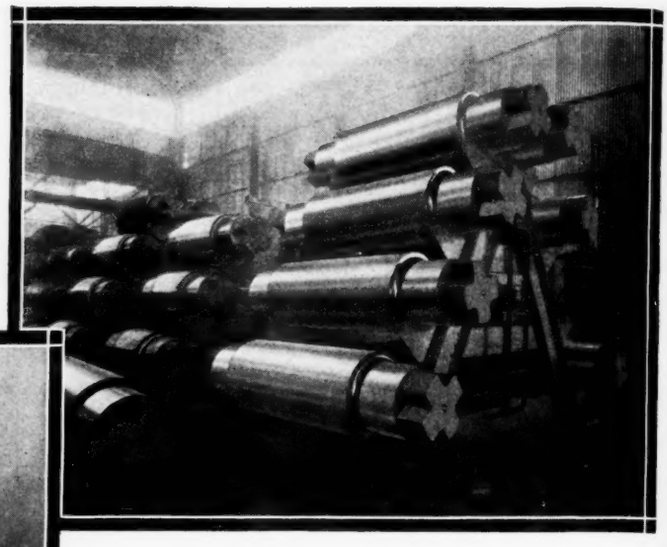
The use of light rays in industry for the prevention of sickness and accident, discussed by Dr. Henry F. Kallenberg, in The Foreman, December 1930, p 12, 2 pp., 3 illusts.

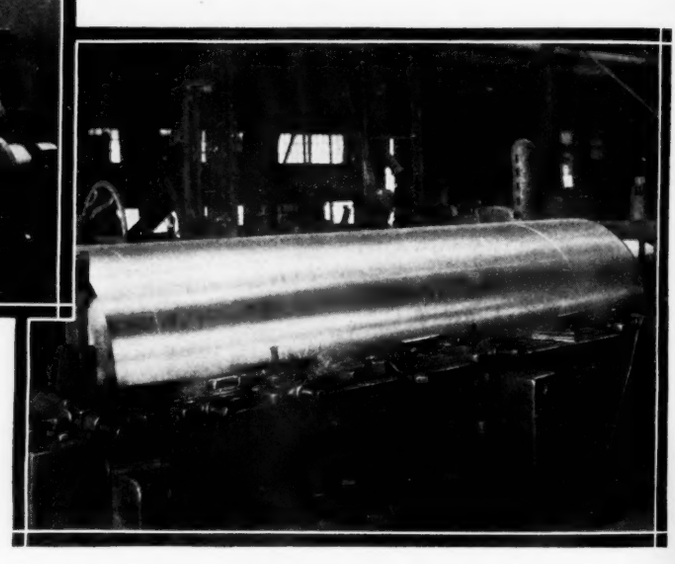
Sickness is responsible for 30 to 85 per cent of all cases of disability leading to absenteeism. Furthermore, any program that will reduce sickness is very likely to reduce the number of accidents. It is the "Half-sick" individual, who is not sick enough to be in bed, that is liable to cause accidents. Nothing so undercuts the morale of an employe and his family as financial stress and there is no one thing that reduces the earning power of the worker as does sickness. The author states that sun-baths, artificially produced by ultra-violet rays, for tonic or hygienic effects, taken under properly installed lamps and with the correct technique, will materially reduce the number of absentees due to the affections of the nose, throat or lungs.

—STEEL 1-15-31

There is a Correct Type of
UNITED







UNITED ROLLS

Unefco Hard	United Spec. Steel
Unefco Medium	Regular Steel
Unefco Mild	Lincoln Spec. Iron
Hot Mill Chilled	Sand Iron
Regular Chilled	Adamite

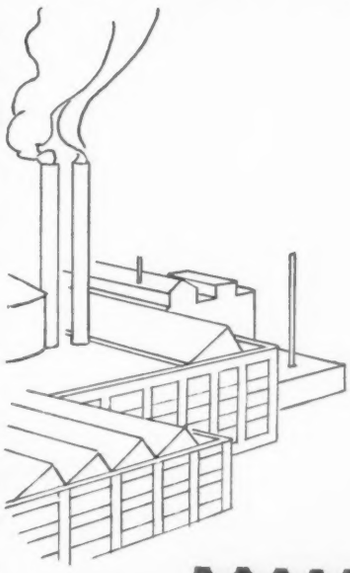
~LARGEST ROLL MAKERS IN THE WORLD~

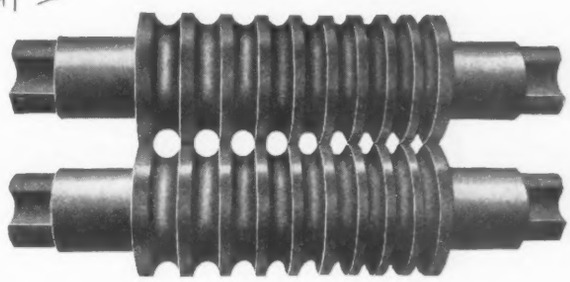
ROLL
for Every ROLLING OPERATION

Trade requirements for rolled products are more exacting today than ever before. Every section rolled, whether standard or special, must meet rigid specifications and inspection tests, covering quality, finish and accuracy. Therefore, it is of utmost importance that the best rolls be used to obtain maximum tonnage of saleable material.

United rolls have been developed in conjunction with the rolling mill industry to meet the most exacting requirements. In this development, close contact has been kept at all times with operating conditions and the growing needs of the trade. They are now made, of a correct grade and analysis, for the rolling of any section from the largest bloom to the smallest and most intricate shape.

Mill operators can avoid costly experimentation and production difficulties by consulting United Roll Engineers—they are always ready to co-operate and can give valuable advice regarding the best grade of rolls to be used for any rolling operation.





UNITED
ENGINEERING & FOUNDRY COMPANY
PITTSBURGH, PENNSYLVANIA

~MAKERS OF THE WORLD'S LARGEST ROLLS~

New Books Worth Reading

SCIENCE ◆ ECONOMICS ◆ BUSINESS

Iron and Steel Plant Personnel and Equipment

Directory of Iron and Steel Plants, 1931, fabrikoid, 312 pages 4¾ by 7½ inches; published by Steel Publications Inc., Pittsburgh, Pa.; supplied by STEEL, Cleveland, for $10, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for £2 10s, postage extra.

Data on blast furnace and steel plant companies is brought up to date in the 1931 issue of this directory. In addition to listing products, some of the principal equipment is tabulated. The personnel coverage of the larger companies goes as far as chief storekeeper, draftsman and foreman. Capacity, capital and railroad connections are listed for many of the companies. This volume includes, as usual, a directory of structural steel, iron, boiler, tank and allied manufacturers.

Both the iron and steelworks and the fabricating lists are presented separately in geographical arrangement, subdivided under state and city heading.

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For Maker and User of Sheets and Tin Plate

Sheet Steel and Tin Plate, by R. W. Shannon; cloth, 285 pages, 6 x 9 inches; published by Chemical Catalog Co. Inc., New York; supplied by STEEL, Cleveland, for $5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 25 shillings, postage extra.

While many books have been written on the production of steel the literature of its utilization is less copious and this volume is a contribution to that phase of the steel industry. The author is an associate member of the American Institute of Mining and Metallurgical Engineers and qualified to discuss the subject. Bradley Stoughton in a foreword to the volume states no other work so far has been written on utilization as well as manufacture.

The author takes as a postulate that equally important with efficient production is economical utilization of products. His effort, then, is to assist the layman toward the best and most economica utilization of sheet steel products. To this end, using technical terms only where unavoidable, he has sought to describe the underlying principles of iron and steelmaking as these relate to sheets and tin plate; the operations and materials involved in the rolling and treatment of these products; the nature and purpose of the numerous grades and finishes in which sheet steel and tin plate are produced.

He has aimed to arrange the topics in the order in which questions concerning them would probably arise in the mind of the reader who has had no previous understanding of the subject. Denominating his work as a "First Reader," he expresses the hope it will give the layman an idea of the materials and their uses and perhaps lead him to a study of the technical works on these subjects.

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Machine Age Brings New Problems of Balance

Menace of Overproduction, by Scoville Hamlin; cloth, 202 pages, 5½ x 8¼; published by John Wiley & Sons Inc., New York; supplied by STEEL, Cleveland, for $2.75, plus 15 cents postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 13s 9d, postage extra.

A symposium by 18 specialists in various branches of industry, a foreword by Stuart Chase and a recapitulation by the author of the constructive proposals of the others makes of this book an important contribution to the current discussion of what is the matter with American business. Lack of balance between production and consumption is pointed out as the basic factor, which differs somewhat in every branch of industry.

Greatly enlarged horizons have made is difficult to see the whole situation and the result is that the machinery of production has no governor and is running wild. A conclusion is that means must be found to control the rate of industrial expansion. A result of this, it is believed, would be a regular business advance without the recurring booms and drastic recessions of the past.

Of significance is the absence of a chapter on steel in this work. Conditions surrounding this industry are such that production is geared to demand and when the latter lessens the former curtails in equal measure. Steel is not made in excess of consuming needs and stocks are not accumulated. There is no overproduction in that branch of industry.

Tools for Working Metal by Pressing Methods

Punches, Dies and Tools for Manufacturing in Presses, by Joseph V. Woodworth; cloth; 538 pages, 5¼ x 8⅛ inches; published by the Norman W. Henley Publishing Co., New York; supplied by STEEL, Cleveland, for $5, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, London, for 25 shillings, postage extra.

With rapidly increasing use of sheet metal parts in connection with modern mass production, the subject of punches, dies and other tools for the making of such parts has assumed vital importance in metalworking practice. Being a subject which has not as yet received much attention from industrial research workers, and one for which it probably always will be difficult to lay down set rules, practical experience is the best guide which can be followed.

This book records by means of clearly written text, numerous simple line cuts, and a few halftones, the experience of a practical production engineer over a remarkably wide field of punching, stamping, bending, drawing, swaging, forging and assembling operations. Not only are design and construction of the tools gone into in detail, but the methods of handling the work in the presses also are explained fully. Most of the illustrations show tools designed by the author and succesfully used under production conditions.

The book contains 20 chapters, or sections, each dealing with some particular phase of the subject. Examples of work range all the way from simple bending jobs to those demanding multiple dies and numerous progressive operations. Cartridges, hardware, pens, needles, watch and clock parts, tableware, sewing machine parts, and drop forgings are among the highly diversified products dealt with.

The number of books available on punch and diemaking and pressed metal working is small in relation to the importance of these arts in the modern industrial scheme just as skilled workers in this field are correspondingly scarce. This book fills a real need and the author has made a valuable contribution to the technique of pressed metal which should inspire and assist many thoughtful workmen to train themselves for service in this relatively uncrowded field.

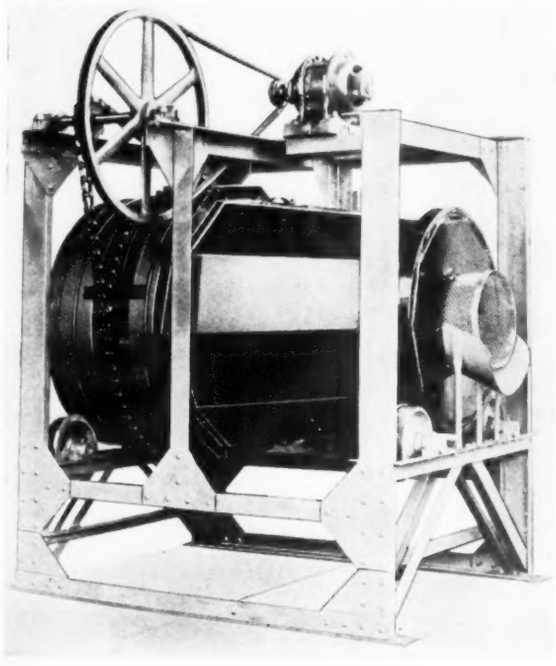
Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

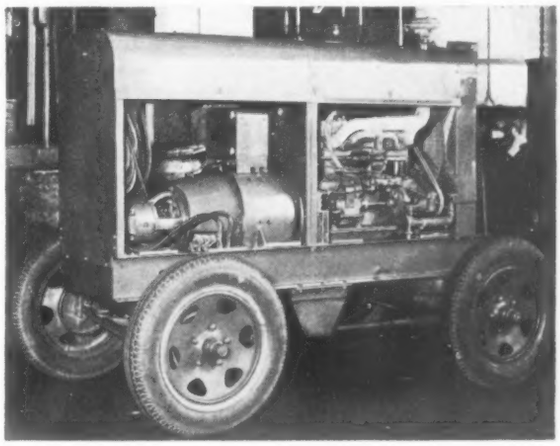
Ball Burnishing Machine Eliminates Rehandling

N. Ranshohoff Inc., Cincinnati, has developed a ball burnishing machine in which rehandling of balls is eliminated. In the operation of this machine, which is shown in the accompanying illustration, the work is charged into the barrel containing the proper quantity of balls. Rotation of the barrel in one direction then gives the work a perfect burnish, the work in the meantime floating in the charge of balls and being unmarred in its delicate details.

After the burnishing operation is complete, the operator reverses the direction of rotation of the barrel, which discharges the work and the balls into a cylindrical screen passing through the center of a metal cone. Here work and balls are automatically separated, the work passing out at the end, the balls passing through the screen to be retained in the metal cone. Fine screen patches on the cone carry off the soap solution. When the barrel again is rotated in the operating direction the balls automatically return to the burnishing chamber, ready for the next batch of work.



Automatic separation of balls from finished work is provided for in this machine, which rapidly produces perfect burnish without marring delicate details of fine work



Widespread operations can be served effectively by this powerful electric welding outfit, whose running gear is built for high towing speeds

Portable Welding Unit Has Capacity of 300 Amperes

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is offering a special type of portable 300-ampere welder for field and street service. This outfit, shown in the accompanying illustration, can be towed from job to job on its own wheels at road speeds. It is adapted particularly for use by public utilities and for other projects where operations are spread over wide areas, as in street service.

A standard 300-ampere, flexible-arc welding generator is coupled to a gasoline engine operating at 1450 revolutions per minute. The generator operates on the variable voltage, constant current principle, with a separately excited shunt field. The exciter is overhung from the rear generator bracket. The control, which consists of field rheostat, ammeter, and voltmeter, is enclosed in a sheet metal cabinet and mounted on top of the generator frame. The four-cylinder power unit has an S. A. E. rating of 28.9 horsepower and registers 42 brake horsepower at 1450 revolutions per minute.

The power unit, generator, exciter and control are all enclosed in a sheet metal canopy with removable sides. Heavy-duty, pneumatic-tired wheels and spring-borne running gear parts are attached to the welded channel base. The front wheels are steered by means of radius rods and king bolt mechanism, with an adjustable steering rod for hand or trailer service.

Many Operations Performed by Work-Cycle Timer

Monitor Controller Co., Baltimore, has developed a work-cycle timer, designed to meet the timing requirements of any electrically controlled work cycle. The mechanism, shown in the accompanying illustration, will start, stop, accelerate, reverse, open,

Keep thy Shop and [The Sayings of

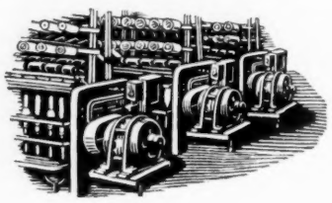
thy Shop will keep thee Poor Richard]

Just Published for 1931

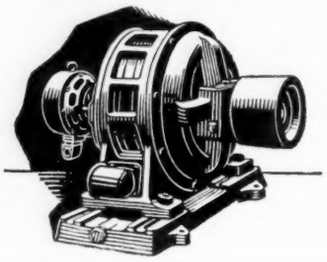
AN

Almanack

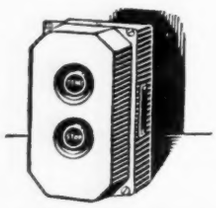
containing wise, thought-provoking suggestions for modernizing industrial plants and published in the firm belief that a penny spent on modernization to-day will be worth ten pennies spent to-morrow.



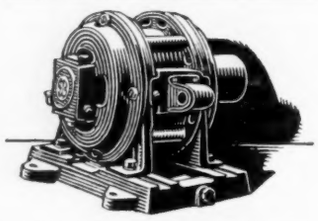
A certain group drive required 164 large bearings and 3600 feet of heavy belting. It was replaced by G-E individual direct-motor drive with 20 small bearings. Maintenance dropped from 65 cents to 12 cents per ton of product.



High power-factor is as beneficial to the plant as to the vendor of electricity. In many cases, the G-E sales engineer can show you how to pay for "leading-power-factor" synchronous motors out of the economies that follow their installation.

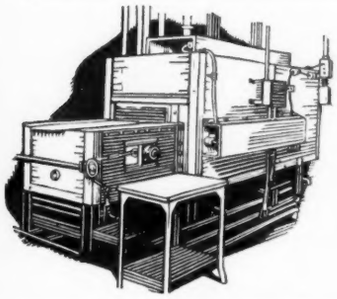


Instead of saying, "I can't use a synchronous motor here because I don't want it to stop at every voltage disturbance," call in the G-E sales engineer and ask him to show you the G-E time-delay devices which keep not only these motors, but all induction motors, on the line for all temporary voltage dips.

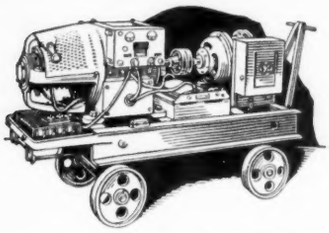


If power conditions in your plant will stand full-voltage starting, there are a number of G-E motors now available for this service that will greatly simplify your control equipment.

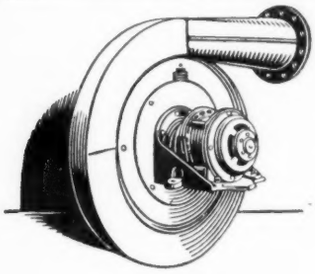
Continued bearing trouble was traced to an uninstructed night man who slapped off the belts by mishandling the starter and kept tightening them up to make them stay on. A G-E magnetic starter would have saved six months of trouble.



A New England manufacturing plant modernized its heat-treating department, at the suggestion of a visiting G-E heating specialist, by replacing four old fuel-fired, batch-type furnaces with a G-E automatic electric conveyor furnace. Handling costs dropped 60 per cent; production was tripled; the products were much improved; and the former high maintenance costs dropped out of the picture.

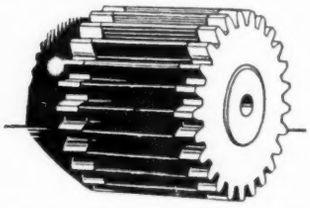


Hundreds of plants are getting "out of the red" and scores of little plants are growing big because they called in the G-E arc-welding specialist to help them modernize their products with arc welding—the greatest of modernization tools. It's almost impossible to strike an arc without improving design or cheating the scrap heap with a neat repair.



No better time to replace those old, inefficient blowers in the forge shop with modern G-E blowers that speed up production by maintaining uniform pressure on each furnace and reduce power costs because they are so efficient. Also, the operation of your cupolas can be greatly improved, and a substantial saving in coke effected, by installing a G-E cupola blower with automatic blast-gate control.

Give your plant engineer some G-E Thyratron or photoelectric tube equipments to play with and you'll be surprised at the number of places where he can use them to speed production, simplify control, and cut costs.



After you've replaced a stripped pinion on a motor shaft a few times, ask the G-E sales engineer to send you a Fabroil or a Textolite pinion. They outlive most other pinions by wide, wide margins. They practically eliminate noise, too.

Modernization Reduces Costs — Increases Profit

There are any number of ways in which the G-E sales engineer can help you to modernize. Ask him about them when he calls; or write the nearest G-E office.

GENERAL ELECTRIC

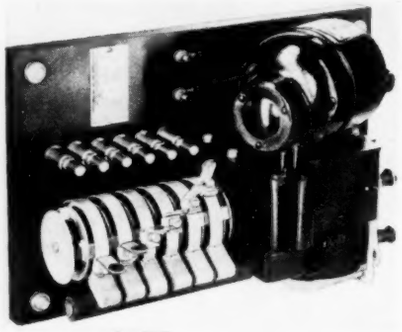
200-426

close or do anything that can be done by electricity and it carries out the operations in sequence and at definite time intervals. The device can be reset instantly, at the starting point, at any time during, or after, the completion of the cycle.

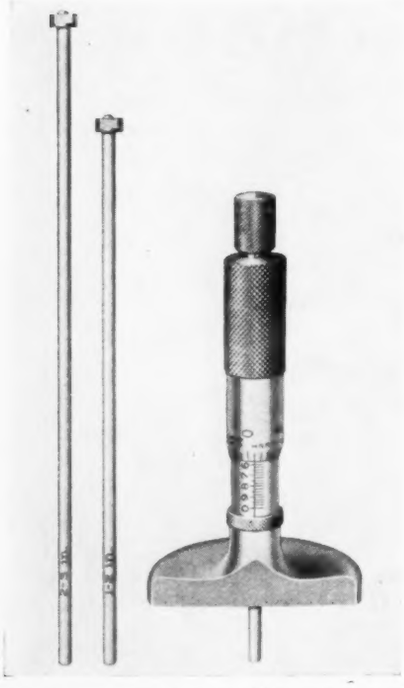
Simple Construction

The current-carrying switches in a given timer unit are all electrically connected on the pivoted side. Each individual switch consists of a rotatable disk carrying an adjustable contact point, and a post fixed on the panel and connected directly to the circuit to be controlled. As many of these switches are provided as there are circuits in the sequence. The rotatable disks are mounted loosely on a sleeve which is carried on a revolving hollow shaft. Each such disk is between two rotating disks that are keyed to the shaft. These rotating disks are equipped with carbon blocks that bear lightly against the switch disks.

The rotating hollow shaft is driven by a constant-speed motor. Through its center extends a clutch rod that can be moved by the action of a powerful magnet. When the magnet is excited, the clutch rod is pulled to the right, and all the disks are pressed together, pressure starting with the outside disk and passing through the line, so that there is the same pressure between all disks. The switches then rotate, being driven through friction by the driving disks. Rotation of each switch continues until it closes on its stationary contact post. From that time on, it simply slips between its driving disks. When the magnet is released, the pressure is removed from the disks and the reset weights cause all the switch disks to drop back to the normal rest position, ready to start again.



Work cycle timer is important factor in automatic electric control



Depth gage gives wide range of micrometer measurements

Depth Gage Provides Wide Range of Measurements

Lufkin Rule Co., Saginaw, Mich., announces a new micrometer depth gage which has a measuring capacity of from 0 to 3 inches by thousandths. The tool, shown in the accompanying illustration, has a half-round base, 2 inches in diameter and is particularly adapted for use in small areas. The range in measuring capacity is obtained by use of three different lengths of interchangeable measuring rods, 3/32 inch in diameter, which are securely fastened by the knurled cap. The micrometer screw has a movement of 1 inch.

Switchgears Are Designed for 600-Volt Operation

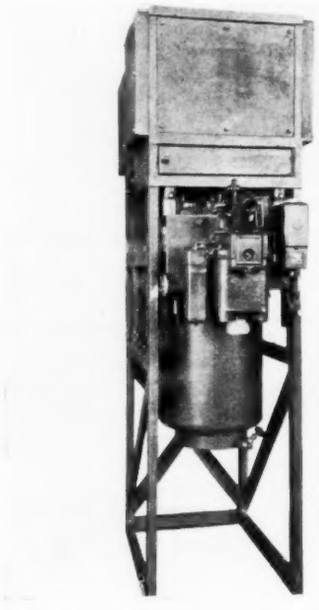
General Electric Co., Schenectady, N. Y., is marketing a new metal-enclosed switchgear of the draw-out type, designed for 600-volt operation. The units are mounted side by side, each unit including a double tier stationary element and two removable circuit breaker elements. Electrically or manually operated trip-free air circuit breakers, or oil circuit breakers, up to 7500 volts, 600 amperes or 600 volts, 800 amperes can be used. This type of gear can be adapted to a single or double bus, double breaker arrangement. Incoming connections can be brought to the bus by inserting an incoming line compartment in any desired location in the line of the units.

Stretcher-leveled steel panels are mounted on removable elements. The panel is provided with insulating levers, while the rear plates of the station elements have screened openings for ventilation. Interlocks securely hold the removable element in the operating position and automatically trip the circuit breaker when the removable element is withdrawn or inserted. The removable element can be withdrawn to a "test position," where the connections remake and the main disconnecting devices are separated or it can be removed and a spare unit inserted.

Millers Are Built To Use Tungsten Carbide

Kearney & Trecker Corp., Milwaukee, has developed a new line of production-type milling machines designed throughout for effective application of cemented tungsten carbide cutters. As indicates by the accompanying illustration, these machines have an appearance of rugged simplicity. They are furnished in three standard speed ranges, each having 12 changes, the speed ranges being 15 to 150, 30 to 300, and 100 to 1000 revolutions per minute.

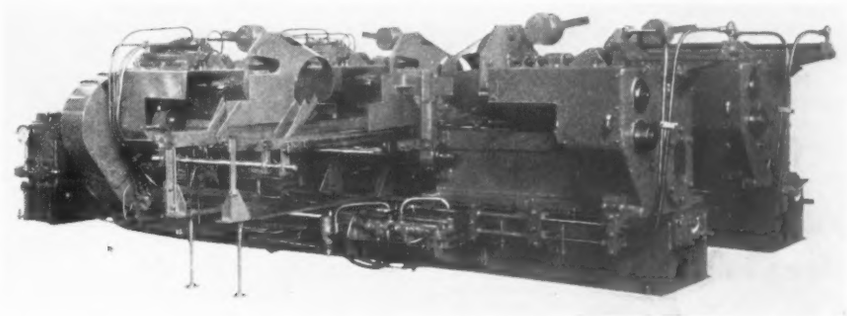
The design comprises five major units; bed, double uprights, spindle block, saddle, and table. The one-piece cast-iron bed contains all operating units, including motor, main drive clutch and brake, speed and feed gear units, coolant and lubricant



Switchgear is adaptable to single or double bus

pumps, and reservoirs. A heavy bolted saddle allows all table operating units to be self-contained and readily accessible. This construction stiffens up the entire machine by eliminating the usual large opening at the front of the bed.

The end of the spindle quill is anchored to the double overarms by a heavy brace. When the quill is moved outward this brace moves along with it, thus providing to spindle and cutters what may be termed "adjustable rigidity." The quill is a steel forging, hardened and ground, is 7 inches in diameter, and has a 7-inch cross adjustment.



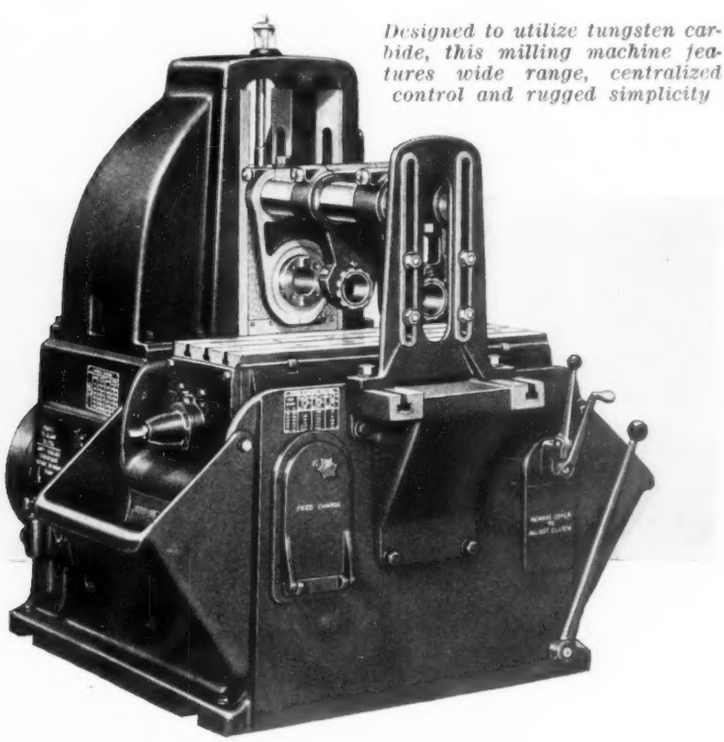
Progressive operations on sheet steel drums are performed automatically on these machines, which employ the hydraulic method of control

Spindle Mounting

The spindle is mounted on three large roller bearings, those at the ends being of tapered type, while a third on the inside hub of the spindle quill is of straight type. Drive is through heavy herringbone gears, that on the spindle being mounted solidly, and its driving pinion splined. Main drive from the motor is by four Vee belts. A pivoted motor bracket permits belt adjustment. The spindle block is carried between heavy double uprights, and when clamped up, the head becomes practically one solid unit. Vertical adjustment is by means of a handcrank at the left side of the bed which carries a dial graduated to 0.001-inch.

Two ranges of feed, each with 18 changes, are offered, these being ½ to 20 inches, or 1 to 40 inches per minute. Feed changes are made by pickoff gears reached by opening a door in the front of the frame. Rapid table traverse of 240 inches per minute cuts down nonproductive time. Dogs controlling feed and rapid traverse are located in a built-in, covered compartment in the front of the machine. The machines are built with tables of 12 and of 18-inch width, with Tee-slots for ⅝-inch bolts, and self-cleaning work stop holes ¾-inch in diameter.

Automatic lubrication from a geared-type pump is provided. Large volume of coolant at low pressure is flooded over cutters and work by a large gear-type pump which comes into action automatically when the spindle is engaged. Large troughs at each end of the machine project beyond the table even when in its extreme position, thereby keeping coolant and chips off the floor. The machines range in weight from 7300 to 8300 pounds. Motors either of 5 or of 7½ horsepower are used.



Designed to utilize tungsten carbide, this milling machine features wide range, centralized control and rugged simplicity

◆

Automatic Machines Form Sheet Steel Drums

Niagara Machine & Tool Works, 637 Northland avenue, Buffalo, has developed a set of automatic machines for the rapid production of sheet metal drums. The accompanying illustration, which shows two of the complete battery of four of these machines, indicates the nature of their design. They are capable of working steel up to 16 gage, and will handle drums ranging from 9½ to 24 inches in diameter and 14 to 42 inches in length.

Drum bodies are received after having been rolled to cylindrical shape and welded, and in their progress through the battery they are flanged, rolling bead expanded, rolling bead rerolled and corrugated, this at a speed of five per minute. The bodies are fed through automatically and ejected when completed, an operator to place them in the feed mechanism being the only one required. Any unit except the first, which does the flanging, can be stopped without stopping the feed mechanism, drum bodies continuing freely to pass through the idle units.

Operations are performed on both ends of the work simultaneously. All motions, except rotation of rolls, are carried out by hydraulic cylinders under oil gear control. Rolls are revolved by individual motors. Each unit has its own reciprocating feed. Two slides carrying the upper rolls are provided with tapered pilot plates, and as these slides come toward each other, the drum body is centered automatically by the tapered pilot plates, which at the same time round up those which are dented or otherwise misshapen. The high, narrow rolling bead, though it requires two opera-

tions, gives the drums high resistance against crushing. Welding plays an important part in the construction of these machines, beds and a number of other units being fabricated from steel shapes and plates.

◆

Air-Driven Grinders Give Remarkable Speeds

Madison-Kipp Corp., Madison, Wis., has announced the addition of three high-speed models to its line of air grinders. These new models, one of which is shown in the accompanying illustration, will operate at

Air turbine gives spindle revolutions up to 100,000 per minute

speeds of 60,000 to 100,000 revolutions per minute. One of the models is a low-pressure grinder, designed to develop 60,000 revolutions per minute on 30 to 50 pounds air pressure. Another model also operates at a speed of 60,000 revolutions per minute, but requires pressure of 50 to 100 pounds. The high-pressure model requires 100 to 120 pounds pressure, and operates at 100,000 revolutions per minute.

Each of the models is small enough to be held in the hand. To reduce friction incident to the high speeds, the new models are equipped with ball bearings at both top and bottom. Lubrication is through the spindle, which is hollow and cross-drilled with 1/32-inch holes. The oil is introduced at the end of the spindle by means of a syringe oiler.

◆

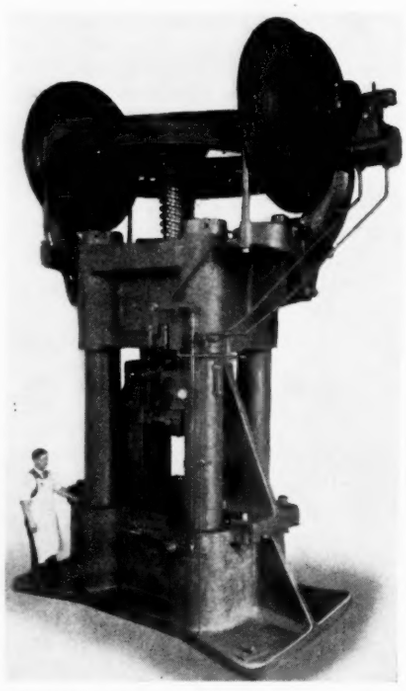
Worm Gear Speed Reducers Have Medium Capacity

W. A. Jones Foundry & Machine Co., 4401 Roosevelt road, Chicago, has added to its line of worm gear speed reducers a new line especially designed for use with small electric motor drives. These reducers are made in three sizes ranging in capacity up to 7 horsepower, each size being supplied in eight different speed ratios, ranging from 5 to 1 up to 50 to 1.

The reducers are manufactured on a production basis, parts being interchangeable so that assembly and repair is simplified. The worm wheel is made of nickel phosphor bronze alloy, which is dry sand cast and then chilled. The teeth, which have wide included angles, are hob generated. The shaft is a high carbon steel forging, ground to size. The worm, which is of small diameter, is integral with its shaft. It is hardened and ground all over. In addition to being ground, the threads are buffed.

Worm and worm wheel are enclosed in a rigid housing of close grained gray cast iron with removable side plates. The shafts run on tapered roller bearings and lubrication is by oil bath, an oil level riser being provided at the rear of the housing to insure proper filling. Sling rings on the worm wheel shaft and a simple type of oil seal ring prevent leakage.

The wormwheel shaft has a double projection so that the reducer may be connected from either side, thus obviating the necessity of a right and left-hand assembly. It also allows two machines to be driven at once, one from each side. A tubular steel guard, which is driven in place over a hub on either side of the housing, encloses the unused end of the shaft.



Percussion press requires 75 horsepower and yields 900 tons normal working pressure

Safety Goggle Designed To Fit Over Spectacles

Willson Products Inc., Reading, Pa., recently has placed upon the market a new type goggle which may be worn over corrective spectacles. One style is made especially for chippers, grinders, etc., and is equipped with hardened lenses. The new goggle is light weight but strong, is well ventilated and is equipped with unground lenses. It is claimed that the

New safety goggle allows wearing of ordinary corrective spectacles

new goggle eliminates the necessity of grinding special lenses for workmen with defective eye sight, that toughness of the lenses is not sacrificed or damaged by grinding, that the goggle is more comfortable, and that less eye strain results because of improper lenses.

◆

Powerful Percussion Press Stands 22-Feet High

Zeh & Hahnemann Co., Newark, N. J., has completed what is said to be the largest percussion power press ever built. The press, shown in the accompanying illustration, is of the 4-pillar built-up type, has a height of 22-feet overall, requires 75 horsepower for operation, and weighs 85 tons.

The machine has pneumatic control and is easily operated. It reverses automatically at the end of the down stroke and stops promptly at the top of the up stroke. It has a maximum stroke of 26-inches at the rate of 10 per minute. With shorter strokes a corresponding increase in number per minute is obtained.

While this press is rated to yield normally 900 tons, the maker states that the pressure will rise to 4000 tons if no work is done. When this condition exists, the contact of the dies transmits the energy to the remainder of the machine and the energy is taken up harmlessly by elastic deflection of the parts. The flywheel energy amounts to 100,000 foot-pounds.

Steel Gains, But at Slower Rate

Rebound from Year-End Low Carries Operations to 45 Per Cent, Further Support Must Come from Consumption—Building Needs Lead—Prices Stronger

STEEL production has expanded this week to about 45 per cent, all districts save Buffalo reporting increased or unchanged rates. This is a gain of 3 points over last week and recoups all of the loss in operations since mid-November.

Improvement in production thus far in 1931 is traceable to the rebound from the extreme low of the holiday period, the release of material held up in December partially for inventory reasons, and the automatic passing of considerable rail tonnage to the mills for prompt rolling.

To a moderate extent, further support may be expected from expanding rail output, but it is increasingly apparent that in the main the mills must look to actual consuming requirements for any further appreciable advance in production.

There is no diminution of confidence that the trend in consumption of steel is up, and neither producers nor consumers have any stocks, but it is more clearly recognized that progress will be made slowly. Recent sales meetings of the two largest producers were characterized by the conviction the depression is over and slow but sustained improvement is ahead.

Building continues the most active outlet for finished steel, this week's awards totaling 27,383 tons comparing with 41,131 tons last week and 27,593 tons a year ago. Automotive requirements still lack the vigor usually imparted by Ford and Chrysler, and probably will the remainder of this month, although on the whole slightly more steel is moving to Detroit.

Railroads are rapidly concluding their rail purchases. The Pennsylvania has distributed 200,000 tons and the Burlington 36,500 tons. Chicago mills for the season have booked 375,000 tons and expect 212,500 tons more, the average being about 60 per cent of a year ago. New York Central, Pennsylvania, Erie, Baltimore & Ohio, Central of New Jersey, Maine Central and New Haven are closing on track fastenings.

Car orders of the week include 1000 by the Canadian National and 30 by Carnegie Steel Co., and a total of 1550 underframes. December freight car awards of 2729 made the 1930 total 45,146 cars, compared with 106,105 in 1929, 44,763 in 1928 and 63,295 in 1927.

From raw material to finished products, the iron and steel markets lack the impulse of large business, except perhaps the Standard Oil Co. of New Jersey commitment for 200,000 boxes of tin plate, an export inquiry for 40,000 to 50,000 tons of steel pipe, and the award of 40 barges requiring 25,000 tons of steel by the Inland Waterways Corp. Most consumers have covered at least part of their first quarter needs, and producers are more interested in eliciting specifications than in entering new contracts.

Prices are colorless because untested. The few adjustments in scrap balance. Basic pig iron is easier in eastern Pennsylvania, where sales continue large. Galvanized sheets are softer in the East. Reinforcing bars are being advanced $1. Bars and plates approach a single asking price of 1.65c, Pittsburgh, or equivalent, to average buyers. Shapes are uncertain, due to increasing resort to the fabrication-in-transit privilege and the new Weirton base. This week STEEL's market composite is up 7 cents to $31.73, the first rise since June.

Lake Superior iron ore interests look for a late opening of the 1931 season. South African manganese ore has appeared in the East at 2 cents a unit under Caucasian ore.

By districts, steelworks operating rates this week are: Youngstown 44 per cent, Birmingham 58, Buffalo 42, Chicago 40, Pittsburgh 45, Cleveland 50 and eastern Pennsylvania 44. The increase of 303,960 tons in unfilled orders of the Steel corporation for Dec. 31 was the largest for 1930, but is ascribable largely to rail orders. The Corporation's orders Dec. 31 totaled 3,943,596 tons, against 4,417,193 tons a year ago.

Especially in the Youngstown district, economies in the production of bessemer steel in a period of light schedules have prompted a relatively greater output of this grade of steel.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (Jan. 14, 1931)	**$31.73**
Last week (Jan. 7, 1931)	**31.66**
One month ago (December, 1930)	**31.74**
Three months ago (October, 1930)	**32.26**
One year ago (January, 1930)	**35.56**
Ten years ago (January, 1921)	**51.98**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Jan. 14, 1931	Dec. 1930	Oct. 1930	Jan. 1930
PIG IRON				
Bessemer, del. Pittsburgh	$18.76	18.76	19.36	20.76
Basic, valley	17.00	17.00	17.00	18.50
Basic, eastern del. eastern Pa.	17.50	17.50	17.50	19.20
No. 2 foundry, del. Pittsburgh	18.26	18.26	18.46	19.76
No. 2 foundry, Chicago	17.50	17.50	17.50	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.70
**No. 2X, Virginia furnace	18.25	18.25	18.25	18.25
**No. 2X, Eastern del., Phila.	18.26	18.26	19.26	21.56
Malleable, valley	17.50	17.50	17.80	19.00
Malleable, Chicago	17.50	17.00	17.50	20.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	17.63	17.63	17.83	19.13
Ferromanganese, del. Pittsburgh	89.79	93.29	103.79	104.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.50	2.50	2.60	2.55
Connellsville foundry, ovens,	3.25	3.50	3.50	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	30.00	30.50	31.00	33.80
Sheet bars, open-hearth, Pitts.	30.00	30.50	31.00	33.80
Billets, open-hearth, Pittsburgh	30.00	30.50	31.00	33.80
Wire rods, Pittsburgh	35.00	35.50	36.00	40.00

	Jan. 14, 1931	1930 Dec.	1930 Oct.	1930 Jan.
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.60	1.60	1.90
Steel bars, Chicago	1.70	1.70	1.70	2.00
Steel bars, Philadelphia	1.94	1.89	1.89	2.17
Iron bars, Chicago	1.70	1.70	1.75	2.00
Shapes, Pittsburgh	1.60	1.60	1.60	1.90
Shapes, Philadelphia	1.81	1.76	1.76	1.91
Shapes, Chicago	1.70	1.70	1.70	2.00
Tank plates, Pittsburgh	1.65	1.60	1.60	1.90
Tank plates, Philadelphia	1.80½	1.80½	1.80½	2.05
Tank plates, Chicago	1.70	1.70	1.70	2.00
Sheets, blue anl., No. 13, Pitts.	2.05	2.05	2.15	2.30
Sheets, black, No. 24, Pitts.	2.35	2.35	2.40	2.70
Sheets, gal., No. 24, Pittsburgh	2.90	2.90	3.00	3.35
Sheets, black, No. 24, Chicago	2.50	2.50	2.60	2.90
Sheets, blue anl., No. 13, Chicago	2.20	2.30	2.30	2.50
Sheets, galvanized, No. 24, Chi.	3.05	3.15	3.20	3.55
Plain wire, Pittsburgh	2.20	2.25	2.30	2.40
Wire nails, Pittsburgh	1.90	1.90	2.00	2.35
Tin plate, per base box, Pitts.	5.00	5.00	5.00	5.25
SCRAP				
Heavy melting steel, Pitts.	13.00	12.75	14.80	16.55
Heavy melting steel, eastern Pa.	10.50	11.00	12.00	14.50
Heavy melting steel, Chicago	10.00	10.00	11.55	12.65
No. 1 wrought, eastern Pa.	13.00	13.50	14.25	15.25
No. 1 wrought, Chicago	9.50	10.00	10.95	13.40
Rails for rolling, Chicago	13.00	13.00	14.10	14.65

Sheets

Slower Progress Noted in Market—Small Consumers Making a Better Showing Than Large

SHEET PRICES, PAGE 63

Pittsburgh—Sheet business shows little improvement in either specifications or production. Mills have a fair volume of business on books but releases against this tonnage are slow. The pickup in automotive activity since the first of the year has been productive of only moderate tonnages for immediate requirements. Miscellaneous consumers of sheets are taking a little more tonnage than leading buyers such as the automotive or farm implement industries. Prices continue to show a steadier tone than usual, partly due to the fact that the depressed level of quotations has resulted in sharply contracted earnings for producers. Prices are 2.35c, Pittsburgh, for black sheets, 2.90c to 3.00c for galvanized, 2.05c for 13 gage blue annealed and 1.90c for blue annealed plates and 3.30c for autobody. Mill operations continue around 40 per cent.

New York—No perceptible increase in new sheet tonnage is noted here, although prices are steady. Galvanized sheets are 2.90c, Pittsburgh, to jobbers and 3.00c to the general trade; black, 2.35c; No. 10 blue annealed, 1.90c and No. 13 blue annealed, 2.05c.

Philadelphia—Sheet buying by the automotive industry and anthracite mines has improved. Prices are firm, except on galvanized which now generally are 2.90c, Pittsburgh. The Pennsylvania railroad was to open bids Jan. 13 on 800 tons of sheets, including various gages of blue, black and galvanized.

Youngstown, O.—Makers of common black sheets are receiving a fair run of new business and show a disposition to adhere firmly to 2.35c, Pittsburgh. A satisfactory amount of new business in autobody and furniture sheets also is coming through, autobody sheets holding at 3.30c. Mill operations have improved slightly and makers are hopeful of larger business this month.

Cleveland—Deviations from quoted price levels are rare, producers evidently being intent on establishing a foundation for a stronger market in the second quarter. Releases are more numerous from the automotive industry, Ford releasing some attractive tonnage, and Chevrolet taking sheets on the basis of 19,000 bodies weekly, from the Fisher Body plant here. Makers of stoves and iceless refrigerators call for increased tonnages.

Chicago—A good order mail the first of the week helped sheet mills to schedule operations at 40 per cent. Specifications from the larger buyers have been relatively slower than users of lighter tonnage. No. 13 blue annealed sheets remain at 2.15c to 2.25c, Chicago district mills, although the lower price applies only to carload business and over. Ten independent mills are down at Milwaukee, but a galvanizing pot is operating intermittently there and shipments of black sheets are being made from stock. Prospects for the outdoor roofing and conductor pipe trade in the Southwest appear brighter.

St. Louis—Demand for blue annealed and galvanized sheets is more active, many users replenishing stocks. Prices are steady. Tank plates, while a shade more active than during the first week of the month, continue quiet.

Cincinnati—One unit of a sheet mill interest in this district will go on a full production schedule to balance steady improvement in bookings.

Two Years Without Accident

Two years without a lost time accident is the exceptional safety record at the Bethlehem Steel Corp.'s limestone quarry, Hanover, Pa. During 1929 and 1930 the number of hours worked totaled 476,424. In the two preceding years there were ten lost time accidents, including one fatality, for a total 624,421 hours worked. About 100 men are employed.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.35c
Philadelphia, delivered	2.64c
Gary, Indiana Harbor	2.45c to 2.55c
Chicago, delivered	2.50c to 2.60c
Birmingham, base	2.50c to 2.60c
St. Louis, del.	2.80½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.65c to 2.75c
Gary, base	2.75c to 2.85c

GALVANIZED NO. 24

Pittsburgh, base	2.90c to 3.00c
Philadelphia, delivered	3.19c
Chicago, delivered	3.05c to 3.15c
Gary, Indiana Harbor	3.10c
Birmingham, base	3.05c to 3.15c
St. Louis, del.	3.35½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.05c
Chicago, district mills	2.15c to 2.25c
Chicago, delivered	2.20c to 2 30c
St. Louis, delivered	2.50½c
Philadelphia, delivered	2.34c
Birmingham	2.20c to 2.25c

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base	1.90c
Chicago, district mills	2.00c to 2.10c
Chicago, delivered	2.05c to 2.15c
Philadelphia, delivered	2.19c
St. Louis, delivered	2.35½c
Birmingham	2.05c to 2.10c

AUTOMOBILE NO. 20

Pittsburgh, base	3.30c

FURNITURE NO. 24

Pittsburgh, patent leveled	3.60c

Tin and Terne Plate

Prices per 100-pound box Pittsburgh

Tin plate, coke base	5.00c
Gary, Ind., base 10 cents higher.	
Long ternes, 24, assorted	3.55c
Long ternes, 24, unassorted	3.45c

Wire Products

(To Jobbers-Merchant Trade)
F.o.b. Pittsburgh, Cleveland base

(Per 100 pound keg)

Standard wire nails	$1.90 and 2.00
Cement coated nails	1.90 and 2.00
Galvanized nails	3.90 and 4.00

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.05c and 2.15c
Galvanized wire	2.50c and 2.60c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c to 2.30c
Spring wire	3.20c
Wire, delivered Detroit	2.50c
Nails, delivered Detroit	$2.35

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.80½c to 1.85½c
New York, del.	1.88c to 1.93c
Boston, del.	2.00c to 2.05c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Coatesville, Pa., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.10c to 2.20c
St. Louis, del.	1.95½c

Structural Shapes

Base, Pittsburgh	1.60c to 1.65c
Philadelphia, del.	1.81c
New York, del.	1.85½c to 1.90½c
Boston, del.	1.88½c to 1.98½c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.83½c
Lackawanna, N. Y., base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Pacific Coast, c.i.f.	2.15c to 2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.60c to 1.65c
Chicago, base	1.70c to 1.75c
Birmingham, base	1.75c to 1.80c
Lackawanna, N. Y., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.25c
Cleveland, base	1.70c
Philadelphia, del.	1.94c
New York, delivered	1.93c to 1.98c
Boston, delivered	2.00c to 2.05c
Pittsburgh, cold finish	1.75c to 1.80c
Pittsburgh, forg. qual.	1.85c to 1.90c

RAIL STEEL

Chicago Heights	1.60c to 1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.70c to 1.75c
New York, delivered	1.98c to 2.08c
Philadelphia, delivered	1.94c to 1.99c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet	1.70c to 1.80c
Chi., rail steel	1.50c to 1.60c
Philadelphia, cut lengths	2.19c
Cleveland, cut lengths	1.95c to 2.05c

Cold-Finished Steel Bars and Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.10c
Shafting, turned and ground, mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel
Sheets, 35c; plates 31c; bars 28c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1,25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10	
2300	1.50	Cr.	0.45
2500	2.25	51.00 Cr.	
3100	0.55	spring	0.20
3200	1.35	6100 bars	1.20
3300	3.80	6100 Spring	0.95
3400	3.20	Cr., Ni., Van.	1.50
4100 .15 to .25		Carbon Van.	0.95
Mo.	0.50	9250 (flats)	0.25
4600 .20 to .30 Mo.		9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.65c to 1.70c
Hot strip 6 1/16 to 24-in. Pitts.	1.55c to 1.60c
Hot strip, bands 6 in. and under, Chicago	1.75c to 1.80c
Do. 6 1/16 to 24 in.	1.65c to 1.70c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do, Chicago	2.00c to 2.10c
Cold rolled strip, Pitts., Cleve., 3 tons, over	2.25c to 2.35c
Worcester, 3 tons, over	2.50c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills.	$34.00
Light rails, Chicago	$36.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts.	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread 73 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list 73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts 73 off
Tire bolts, 60, 10 and 10 off.
Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished 73 off

HEXAGON CAP SCREWS

Milled 80-10-10-5 off
Upset 1 in. diam. and smaller 85-10 off

SQUARE HEAD SET SCREWS

Milled 80-5 off
Upset 1 in. and smaller 80-10-5 off
Upset, larger than 1 in. 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l., Pittsburgh	2.40c
do, less carloads, 5 kegs or over, 2.65c; and less than 5 kegs, 2.80c.	
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	2.00c

Bars

Buying Not Sufficient to Test 1.65c, Pittsburgh, Quoted on Most Current Inquiries

BAR PRICES, PAGE 63

Chicago—Most bar and other finished steel tonnage booked at 1.75c, Chicago, has been in spot orders from smaller users of mixed lots. Business on the 1.70c basis predominates, as much holdover tonnage covering specific work at that figure remains. The market is not being tested. Larger buyers are reported by mills to be more nearly at a one price basis now, as the 1.70c quotation seems materially strengthened. Bar tonnage gains have been largely from automotive releases of a few large car builders. Implement specifications are slow, but the outlook is improving. Inquiries have been picking up. Bar mills operate at 35 to 40 per cent.

New York — While 1.65c, Pittsburgh, on steel bars is yet to be fully tested, this figure appears to apply to the general round of new business. There has been no material pickup in tonnage, however, and few large individual tonnages are before the trade.

The common iron bar market is unsettled, with 1.65c to 1.75c, Pittsburgh, the prevailing range, and some tonnage going as low as 1.60c. Demand is slack.

Philadelphia — Demand for steel bars is somewhat less than during the first week in January. The price on new business is firm at 1.65c, Pittsburgh. Iron bar demand is quiet at 1.60c to 1.70c, Pittsburgh.

Pittsburgh—A limited tonnage of steel bars, not covered by contract, is appearing in the open market. Producers are quoting 1.65c, Pittsburgh, and profess to be taking business on this basis. Specifications against contracts are slightly more liberal and are distinctly improved over the light December volume. Buying is better distributed, small consumers who had been out of the market for a number of weeks now showing interest in additional supplies.

Youngstown, O.—Recent inventories of bars in hands of consumers and producers showed a minimum. This has called forth some buying within the last few days. Tonnages are of conservative proportions, largely for quick consumption. Buying of alloy bars is somewhat better than for the past two months. Common steel bars bring 1.65c, Pittsburgh.

Cleveland — There has been a slight upturn in releases during the past week, accountable in part to automotive and allied work. Consumers are quoted 1.65c, Pittsburgh, or 1.70c, Cleveland, depending on which base is to his advantage. Local mills have named, and are getting business, at the week-old 1.70c, base, for both local and outside delivery. Forward purchasing in bars has not been a true test, most consumers of consequence being under contracts made as 1930 closed.

Tin Plate Shipments Gain; Standard Places Order

Tin Plate Prices, Page 63

New York—The Standard Oil Co. of New Jersey has ordered 200,000 base boxes of tin plate. This order is understood to include certain unspecified tonnage on last half contracts and full requirements for the next six months. A decline in the company's requirements is said to be due to the increasing tendency to ship oil and other products abroad in bulk, rather than in small containers. A reduction in the price of Welsh tin plate has so affected the market as to make it unprofitable for American producers to engage in export business in certain parts of the world.

Pittsburgh — Tin plate specifications have made further gains. Business and operations still are somewhat below the usual seasonal levels but producers look for additional expansion within the next several weeks. Tin plate output is slightly higher at 55 to 60 per cent.

Youngstown, O.—Valley tin mills are operating steadily on production plate in preparation for the salmon canning season, shipments to be completed by April. Output of tin plate this year promises to be fully equal to that of last year.

Plates

Award of 40 Barges Features Pittsburgh Market — Eastern Buying Shows Slight Gain

PLATE PRICES, PAGE 63

Chicago—Plate mills are operating at 40 to 45 per cent. The price range remains 1.70c to 1.75c, Chicago, little business having been booked for forward shipment at the latter figure. Skelp shipments for Milwaukee pipe line production have dropped to a few thousand tons a week.

New York—Plate buying has improved slightly, with 1.75c, Coatesville, Pa., the general price. Pending further test, however, the market may still be quoted 1.70c to 1.75c. A leading order involves approximately 5700 tons of 36 and 48-inch steel pipe for the local department of water supply, placed with Alco Inc., subsidiary of the American Locomotive Co. The plates required have been awarded. Approximately 6000 tons of plates will be required for the seven coast guard cutters, on which the Bath Iron Works, Bath, Me., is low bidder.

The Sinclair Refining Co. is placing a substantial tonnage of plates for refinery work at Houston, Tex., Wellsville, N. Y., and Marcus Hook, Pa.

Philadelphia—The plate market continues 1.75c, Coatesville, Pa., with shading less pronounced than last year. Eastern mills are operating at 30 to 50 per cent finishing capacity.

Pittsburgh—New and prospective barge business will provide a fair plate tonnage. Inland Waterways Corp. has awarded contracts for 40 large steel barges, requiring 25,000 tons of plates and shapes, while inquiry of the McCrady-Rodgers Co., Pittsburgh, for 10 barges involves 1500 tons. Plate specifications are slightly more active than during recent weeks but still are seasonally light. Practically all tonnage is covered by contract with producers quoting 1.65c on new business.

Cleveland—Plate contracting is slow, at 1.65c, Pittsburgh. Most large consumers will be releasing business contracted for at 1.60c, base, prevailing before Jan. 1. Lima Locomotive Works' 400 to 500-ton plate order for New York Central locomotives is said to be still pending. Standard Oil Co. of Ohio has some tank work requiring plates.

Contracts Placed

25,000 tons, 40 barges, for Inland Waterways Corp.; 10 each to American Bridge Co. and McClintic-Marshall Co., Pittsburgh; 5 each to Midland Barge Co., Midland, Pa.,

and Marietta Mfg. Co., Point Pleasant, W. Va.; 10 to the Ingalls Iron Works Co., Birmingham, and Alabama Dry Dock & Shipbuilding Co., Mobile, Ala.

180 tons, 3 maneuver boats for United States engineers, Pittsburgh district, to Chas. Hegelwald Co., New Albany, Ind.

5700 tons, 36 and 48-inch steel pipe, New York department of water supply, awarded to Alco Co. Inc., subsidiary of American Locomotive Co., for fabrication at Dunkirk, N. Y.; plates are reported placed.

100 tons, tank work, Standard Oil Co. of New Jersey, Bayonne, N. J., to own shops.

Contracts Pending

6000 tons, seven coast guard cutters. Both Iron Works, Bath, Me., low bidder.

1500 tons, 10 standard deck type barges for McCrady-Rodgers Co., Pittsburgh.

300 tons, two tanks, Long Beach, N. Y.; bids in.

200 tons, standpipe, for Phoenixville, Pa.

Railroads

Rail Orders Are 60 Per Cent of 1929 Total—1000 More Cars Ordered in Canada

TRACK MATERIAL PRICES, PAGE 63

Chicago—Northern Pacific awarded 1500 underframes, part of its program of building 3000 cars in its own shops. Other car equipment inquiry is negligible. Miscellaneous track fastenings orders total about 1000 tons. A portion of the track accessory inquiry of the Pennsylvania railroad, which may total 20,000 tons for early delivery, exclusive of fastenings for maintenance, has been received here. Chicago district rail mills have booked about 3000 tons of miscellaneous rails, including frog and switch makers' requirements, in addition to 52,000 tons of the Pennsylvania's 200,000-ton rail order. Western railroads are ordering more than 60 per cent of their 1929 tonnage, and probably more than 200,000 tons are to be awarded in the West.

Rail orders to be placed with western and southern mills are estimated at 212,500 tons, as follows:

Roads	Tons
Chicago & Eastern Illinois	3,500
Chicago, Indianapolis & Louisville (Monon)	4,000
Chicago, Rock Island & Pacific	30,000
Chicago, Milwaukee, St. Paul & Pacific	40,000
Illinois Central	30,000
Missouri Pacific	30,000
St. Louis-San Francisco	15,000
Soo Line	5,000
Southern Pacific	45,000
Western Pacific	10,000
Total	212,500

The folowing table shows that 1931 tonnage already placed with Western mills exceeds 375,000 tons:

Roads	Tons
Baltimore & Ohio	*10,000
Chicago, Burlington & Quincy	36,500
Chicago Great Western	5,000
Chicago & North Western	15,000
Denver & Rio Grande	10,000
Duluth, Missabe & Northern	1,600
Elgin, Joliet & Eastern	3,000
Erie	*12,850
Great Northern	10,000
Kansas City Southern	9,000
New York Central	*76,500
Northern Pacific	5,000
Pennsylvania	*52,000
Pere Marquette	13,650
Santa Fe	61,200
Union Pacific	45,000
Wabash	10,500
Total	376,700

*Share of total awarded to western mills.

New York—Pennsylvania divided 200,000 tons of rails among four interests, approximately 15 per cent for immediate delivery. On Jan. 13 it closed bids on 480 tons steel axles, 15,000 steel car wheels, as well as sheets, tubes, steel pipe, etc. It closes bids Jan. 19 on 750 tons track spikes, 55,000 pairs of joint bars and 300,000 tie plates on contract No. 1, and 300 tons of joint bars on contract No. 2.

Domestic freight car awards for December, 1930, totaled 2729, making the aggregate for the year, 45,146. A comparison of monthly totals for the past four years follows:

	1930	1929	1928	1927
Jan.	**5,072**	**13,196**	**4,160**	**14,710**
Feb.	**17,027**	**15,944**	**10,220**	**5,960**
March	**6,118**	**12,023**	**2,958**	**4,955**
April	**1,997**	**8,205**	**6,043**	**3,675**
May	**1,392**	**7,562**	**2,531**	**5,425**
June	998	5,886	2,422	7,440
July	*1,389	341	582	2,295
Aug.	*1,111	2,854	677	1,181
Sept.	*576	4,517	1,378	682
Oct.	*4,116	19,506	2,853	886
Nov.	*2,621	6,361	6,140	1,189
Dec.	2,729	9,710	4,799	14,897
Total	45,146	106,105	44,763	63,295

*Revised.

Toronto, Ont.—Canadian National ordered 500 50-ton composite general service and 500 70-ton gondolas from Eastern Car Co. Ltd.

Pittsburgh — New York Central railroad closes bids Jan. 20 on splice bars, track bolts, spikes and tie plates to accompany its recent rail order. Baltimore & Ohio closed on spikes but tie plates for this road and Erie still are pending. New inquiry involves track material for Pennsylvania, Central Railroad of New Jersey, Maine Central, and New York, New Haven & Hartford roads. Miscellaneous steel purchases by carriers have increased moderately during recent weeks.

Buffalo—Large rail orders awarded Bethlehem Steel Co. the past six weeks assure operation of the Lackawanna rail mill. More than 100,000 tons will be rolled here.

Birmingham, Ala.—Rail production once more is well under way at Ensley, Ala., mill of Tennessee Coal, Iron & Railroad Co., closed since Sept. 18. Five open-hearths resumed.

Car Orders Placed

Canadian National, 500 50-ton composite general service cars and 500 70-ton composite drop-end gondola cars, to Eastern Car Co. Ltd., Trenton, N. J.; these are in addition to 2700 reported placed in last week's issue.

Fruit Growers Express, 50 underframes, to Greenville Steel Car Co., Greenville, Pa.

Indiana Service Corp., 35 interurban cars 21 going to Pullman Car & Mfg. Corp., Chicago, and 14 to American Car & Foundry Co., New York.

Northern Pacific, 1000 refrigerator cars, to its own shops, with certain parts to be supplied by Pacific Car & Foundry Co.; car building award was reported last week as going to Pacific Car & Foundry Co., San Francisco; also 1500 underframes, 1000 to Pacific Car & Foundry Co., and 500 to Standard Steel Car Co.

Locomotives Placed

Salt Lake & Utah, one 60-ton electric locomotive, to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Rail Orders Placed

Chicago, Burlington & Quincy, 36,500 tons: 17,200 tons, to Colorado Fuel & Iron Co., Denver; 13,300 tons, to Illinois Steel Co., and 6000 tons, to Inland Steel Co. Tonnage includes 5700 tons for Ft. Worth & Denver City, and Colorado & Southern, subsidiaries. Of the total, 3200 tons were carried over from unfilled 1930 rail order.

Pennsylvania, 200,000 tons as follows: Carnegie Steel Co., Pittsburgh, 45,000 tons, with 15,000 tons optional; Illinois Steel Co., Chicago, 30,000 tons, with 10,000 tons optional; Bethlehem Steel Co., Bethlehem, Pa., and Lackawanna, N. Y., 66,000 tons with 22,000 tons optional; and Inland Steel Co., Chicago, 9000 tons with 3000 tons optional.

Rail Orders Pending

Interborough Rapid Transit Co., New York, 289 subway cars; award indefinitely postponed pending developments in proposed unification plan for New York subway systems.

Sanitary District of Chicago, repairs for 15 air dump cars.

Solvay Process Co., 10 to 13 hopper cars of 75 tons capacity each.

Union railroad, 20 air dump cars.

Structural Shapes

Boston Postoffice Leads Eastern Awards—Activity Somewhat Less — Small Jobs Fairly Frequent but Large Inquiries Scarce—Price Situation Unchanged

STRUCTURAL SHAPE PRICES, PAGE 63

New York—Structural steel bookings without subways, bridges and other engineering work, declined 194,775 tons last year from 1929 lettings, according to the New York Structural Steel Board of Trade. Total lettings for the last three years follow:

Year	Tonnage
1930	467,553
1929	662,428
1928	458,259

December contracts totaled 24,563 tons compared with 25,513 tons in November, 1930, and 105,711 tons in December, 1929. The latter figure is the record and included more than 55,000 tons for the Empire State building, now nearing completion.

Fresh shape inquiries and lettings are dull. A fair volume of pending tonnage remains to be placed, mostly bridges and public work. Private construction is at low ebb. Subway steel probably will not be a factor for at least two months since present plans indicate no bidding before March. All such steel that came out in 1930 is now placed, about 120,000 tons for the year. Next work is expected to be on the Sixth avenue route. Prices generally are unchanged with 1.65c, Pittsburgh, or 1.75c, eastern Pennsylvania mill, subject to little test. Small lots only have moved at the recently announced advances.

Boston—Postoffice buildings, Boston and Fall River, Mass., 8000 and 138 tons, respectively, have been awarded. Several bridge projects are ahead in this district. Included is a $1,000,000 bridge between Charlestown and Chelsea, Mass.

Philadelphia — Shapes are unchanged with 1.75c, base, eastern mills, for standard shapes the minimum of leading mills on new business. Prices quoted on fabricated business, however, do not yet reflect the effect of higher shape prices.

Pittsburgh—Structural steel remains quiet. Awards are light and new inquiry involves few large lots. Specifications for plain material show little change so far this month and are seasonally quiet. Producers usually quote 1.65c, Pittsburgh, on new business with the bulk of tonnage going against lower prices contracts.

Cleveland—Small structural shape awards only are being made, including 100 tons for a building at Toledo, O., for Libbey Glass Co., to Donavan Wire & Iron Co., and 142 tons for a college building at Oxford, O., to Wheeling Structural Co. The trade does not have much ahead of it outside of a sheet mill building for Otis Steel Co., 1600 tons, an 800 to 900-ton building for General Electric Co., a Big Four bridge at West Fortieth street, 354 tons, a 200-ton South high school addition, a 270-ton warehouse at Toledo, for International Harvester Co., an office building at Columbus, O., 500 tons, and a similar tonnage for Indiana university, Bloomington, Ind. Mills quote 1.65c, Pittsburgh, in the open market but are still shipping against 1.60c contracts.

Chicago—Structural mills operate at about 30 per cent. Much tonnage is carried over at 1.70c covering specific jobs. The market is 1.75c, Chicago, to buyers of plain material. While 7000 tons was let for the Ogden avenue improvement program here, more than 15,000 tons will be awarded later. Inquiries include the Missouri, Kansas & Texas railroad bridge over the Missouri river, about 4000 tons. Awards are light.

Birmingham, Ala. — Fabricators' order books now are filling up and they are operating on a 6-day week basis. Prospects are bright for additional business. Ten barges for Inland Waterways Corp., to be fabricated by Ingalls Iron Works Co. and Alabama Dry Dock & Shipbuilding Co., call for 6,00 tons of steel.

Contracts Placed

8000 tons, postoffice, Boston, to McClintic-Marshall Co., Pittsburgh.

Awards Compared

	Tons
Awards this week	**27,383**
Awards last week	**41,131**
Awards two weeks ago	**14,635**
Awards this week in 1930	**27,593**
Av. weekly awards, 1930	**35,242**
Av. weekly awards, 1931	**27,716**
Av. weekly awards, Dec.	**29,804**
Tot. awards to date, 1930	**59,247**
Tot. awards to date, 1931	**83,149**

4650 tons, Louisiana state capitol building, New Orleans, to Lukens Steel Co., Coatesville, Pa.

1600 tons, underpasses, Eighteenth and Twentieth street, Birmingham, Ala., to Ingalls Iron Works Co., Birmingham; Southern Construction Co., Birmingham, general contractor.

1300 tons, Wards Island anchorage, Triboro bridge, New York, to American Bridge Co., New York; Bersin-Romm Engineering Corp., general contractor.

1200 tons, telephone building, Charleston, W. Va., to McClintic-Marshall Co., Pittsburgh.

1000 tons, apartment, West Nineteenth street, New York, to unstated fabricator.

800 tons, tubercular ward, General hospital, Philadelphia, to Bear Engineering Co., Philadelphia; Wark Co., Philadelphia, general contractor.

725 tons, Y. M. H. A. building, Rochester, N. Y., to F. L. Heughes & Co. Inc., Rochester; reported in STEEL of Dec. 25 as 600 tons.

700 tons, Illinois Central railroad bridge over Green river, Rockport, Ky., to Virginia Bridge & Iron Co., Roanoke, Va.

650 tons, Illinois Central railroad bridge in Kentucky, to Virginia Bridge & Iron Co., Birmingham, Ala.

650 tons, municipal power plant, Kansas City, Kans., to Kansas City Structural Steel Co., Kansas City, Mo.

600 tons, express storage building, Chicago, Burlington & Quincy railroad, Chicago, to Wendnagel & Co., Chicago.

592 tons, boiler room addition, Libby, McNeil & Libby, Honolulu, T. H., to Honolulu Iron Works, Honolulu, and the American-Hawaiian Iron Works, Honolulu; listed last week as going to unstated fabricator, 500 tons.

550 tons, Southern Construction Co., highway bridge in Tennessee, to Virginia Bridge & Iron Co., Birmingham, Ala.

550 tons, school, Rochester, N. Y., to F. L. Heughes & Co. Inc., Rochester.

500 tons, James Ford Rhodes high school, Cleveland, to Ingalls Iron Works Co., Verona, Pa.; incorrectly reported Jan. 8 as going to Kilroy Structural Steel Co., Cleveland.

470 tons, six-story health center, Yonkers, N. Y., to Kues Bros. Iron Works, Bronx, N. Y.; J. J. McMahon Co., general contractor.

400 tons, transmission towers, Waco, Tex., to Nashville Bridge Co., Nashville, Tenn.

375 tons, warehouse, Ajax Metal Co., Philadelphia, to McClintic-Marshall Co., Pittsburgh.

300 tons, courthouse, Ogden, Utah, to Denver Iron & Steel Co., Denver.

285 tons, B. M. Palmer school, New Orleans, to Lukens Steel Co., Coatesville, Pa.

280 tons, boiler supports, Consolidated Gas, Electric Light & Power Co., Baltimore to Maryland Steel Products Co., Baltimore.

250 tons, float bridges, Pennsylvania railroad, Greenville, Jersey City, N. J., to American Bridge Co., Pittsburgh.

225 tons, subway, Southern Pacific Co., San Jose, Calif., to Judson-Pacific Co., San Francisco.

225 tons, Warren county bridge, route 8, Blairstown, N. J., to American Bridge Co., Pittsburgh.

210 tons, deck trusses for bridge, Illinois Central, Pullman, Ill., to Continental Bridge Co., Chicago.

210 tons, warehouse, Puget Sound navy

yard, to Star Iron Works, Tacoma, Wash.; Fitten & Livergreen, Seattle, general contractors.

200 tons, Paulins Kill bridge, New Jersey, to American Bridge Co., Pittsburgh.

180 tons, service station, D. Oliver, Pontiac, Mich., to Flint Structural Steel Co., Flint, Mich.

158 tons, postoffice, Fall River, Mass., to John E. Cox Co., Fall River.

150 tons, six-story apartment, Queens Boulevard, Woodside, Queens, N. Y., to J. Klein Iron Works, Astoria, N. Y.

150 tons, building, Callao, Peru, S. A., to United States Steel Products Co., New York.

145 tons, caisson, power line, at Memphis, Tenn., to Virginia Bridge & Iron Co., Birmingham, Ala.

142 tons, physical education building, Miami university, Oxford, O., to Wheeling Structural Steel Co., Wheeling, W. Va.

126 tons, state highway bridge, Freeland, Mich. to McClintic-Marshall Co., Pittsburgh.

125 tons, hospital near Forty-fifth street, Brooklyn, N. Y., to Just Structural Engineering Corp., White Plains, N. Y .

110 tons, 6-story apartment, Jackson Heights, Queens, N. Y., to Gold Seal Iron Works Inc., Brooklyn, N. Y.

100 tons, building, Libbey Glass Co., Toledo, O., to Donavan Wire & Iron Co., Toledo, O.; H. K. Ferguson Co., Cleveland, general contractor.

100 tons or more, repairs, Ninth street bridge, Richmond, Va., to Richmond Structural Steel Co., Richmond.

Contracts Pending

35,000 tons, State street subway, Chicago; preliminary drawings made.

4000 tons, Missouri, Kansas & Texas railroad bridge over Missouri river, at Booneville, Mo.

3332 tons, club building, Motorists' Corp., Chicago; general contract to Paschen Bros., Chicago.

1600 tons, continuous sheet mill building, Otis Steel Co., Cleveland; plans nearly ready.

1000 tons, six prison buildings, Attica, N. Y.; bids in early spring.

1000 tons, postoffice, Pittsburgh.

985 tons, yeast plant in New Jersey for Anheuser-Busch Inc., St. Louis; Lehigh Structural Steel Co., Allentown, Pa., low bidder.

900 tons, wire mill at Cleveland for General Electric Co., Schenectady, N. Y.

800 tons, Steuben junior high school, Milwaukee.

600 tons, magistrates court building, Brooklyn, N. Y.

565 tons, navy yard requirements, delivery at Brooklyn, Philadelphia, Mare Island and Puget Sound: Bethlehem Steel Co. low on eastern needs and Carnegie Steel Co. low on western tonnage.

530 tons, Mandeville street wharf, New Orleans; bids taken by board of commissioners.

500 tons, bridge over Calumet canal, South Chicago, Ill.; bids being received by Cook county commissioners.

500 tons, Union Trust building, Cincinnati, O.; bids in.

500 tons, 8-story office building, Columbus, O.

500 tons, Union building, Indiana university, Bloomington, Ind.

400 tons, Red Cross building, Washington; bids Feb. 6.

365 tons, two state bridges, West Virginia.

354 tons, West Fortieth street bridge, Cleveland, for Big Four railroad, Cincinnati.

270 tons, warehouse, International Harvester Co., Toledo, O.

450 tons, bridge, La Porte, Ind.; bids Jan. 17.

200 tons, addition to South high, Cleveland.

115 tons, theater at Mansfield, O.; bids closed Jan. 14.

Concrete Bars

Engineering, Public Work Heavy—Building Demands Shrink—Ogden Avenue Improvement, Chicago, to Take 3000 Tons—Eastern Prices Up—New Extra Made

REINFORCING BAR PRICES, PAGE 63

New York—Distributors of concrete reinforcing bars have been notified an increase of $1 a ton is pending. The increase is not yet operative here, however. Prices generally are steadier. A new extra is announced by which 25.00c per 100 pounds is charged for odd sizes of less than one ton per lot. Pending engineering and public work is heavy. Small lot orders are fairly numerous.

Boston—Although the past week has been dull in concrete bars, it is expected that 1000 tons for the New England Telephone Co. building at Watertown, Mass., is to be awarded before the week is out. The Boston postoffice, 1500 tons, is slated for letting next week.

Philadelphia—Concrete reinforcing bar sellers now are all quoting 1.65c, Pittsburgh, for mill lengths in carloads.

Pittsburgh—Concrete bar awards are fairly numerous, usually less than 100 tons at a time. The outlook is favorable, however, with a fairly substantial tonnage pending in other districts. Some distributors have announced an advance of $1 a ton on the price of cut length bars with the market usually 1.90c to 2.00c while stock lengths are 1.65c to 1.75c.

Buffalo—New York state will soon take bids on 1000 tons or more of concrete bars for prison buildings at Attica, near here. Bids are in on 200 tons for Buffalo's marine airport.

Cleveland—About 150 tons of concrete bars for the James Ford Rhodes high scheel here was awarded Concrete Engineering Co. Other awards are less-carload lots. A South high school addition will take 150 to 200 tons. A similar total is involved in the Reserve Lithographing & Printing Co.'s new plant and a larger lot will be needed for General Electric Co.'s local wire plant. An underground garage for Cleveland, for which plans now are being drawn, will take several hundred tons. Prices show no change, 1.65c, Cleveland, being named on mill lengths.

Chicago — Fabricators soon will start work on 3000 tons of reinforcing bars for the Ogden avenue improvement, Chicago. Bids are being tabulated on about 2000 tons of road work for Illinois. Billet bar prices are nominal at 1.70c to 1.80c. Building awards are light, although fair inquiries appear.

Another unit of Chicago's sewage disposal plant, totaling 5000 tons, is being figured.

Birmingham, Ala.—While individual concrete bar orders from dealers are small, the aggregate is fairly large. Output is being increased after the holiday shutdown. Some road work is under contemplation.

Awards Compared

	Tons
Awards this week	4,464
Awards last week	13,554
Awards two weeks ago	664
Awards this week in 1930	5,535
Av. weekly awards, 1930	6,990
Av. weekly awards, 1931	6,227
Av. weekly awards, Dec.	3,937
Total awards to date, 1930	10,684
Total awards to date, 1931	18,682

Contracts Placed

700 tons, underpasses, Eighteenth and Twentieth streets, Birmingham, Ala., to Concrete Steel Co., Birmingham; Southern Construction Co., Birmingham, general contractor.

560 tons, warehouse, Crane Co., Brooklyn, N. Y., to Joseph T. Ryerson & Son Inc., Chicago.

370 tons, foundations, west side elevated highway foundations below Thirtieth street, New York, to unstated interest.

250 tons, county court house, Amarillo, Tex., to Colorado Builders' Supply Co., Pueblo, Colo.; C. S. Lambie & Co., Amarillo, general contractors; structural steel to Panhandle Steel Products Co., Wichita Falls, Tex.

250 tons, apartment, Las Palmas and

(*Concluded on Page* 71)

Strip

Slight Improvement in Demand Follows Automotive Quickening—Prices Are Unchanged

STRIP PRICES, PAGE 63

Pittsburgh—Strip specifications are slow to increase. Producers have placed additional tonnages on the books from automotive interests but releases are only small lots. Orders from other consumers also are limited. Prices are fairly steady at 1.65c to 1.70c and 1.55c to 1.60c for the two widths of hot strip and 2.25c to 2.35c for cold strip. Producers have insufficient tonnage to provide sustained operating schedules at anything but a limited rate and production is fluctuating considerably. Hot mill operations average around 35 per cent with cold strip output slightly lower.

Worcester, Mass.—Strip showed a spurt in January over an exceptionally poor December. However, some large bookings are pending from New England automobile parts manufacturers and indications are strong that first quarter production will show a substantial gain. Prices are quoted at 2.50c, Worcester, on cold-rolled.

New York—Sluggishness dominates the strip market. Wide hot strip is largely untested at 1.55c, Pittsburgh, and narrow at 1.65c. Cold strip is nominally 2.25c, Pittsburgh.

Philadelphia — Strip demand is somewhat improved, with better buying, particularly from the automotive industry, railroads and anthracite mines. Prices are unchanged and firm.

Youngstown, O.—A few more hot strip mills have been placed in operation this week by an important maker. Other strip makers are operating about as formerly. While considerable is going to auto partsmakers, yet some disappointment is felt here that strip orders from this source have not met expectations. Quotations on both hot-rolled and cold-rolled strip are steady.

Cleveland—Hot and cold strip steel releases by several automobile producers, notably Chevrolet, Ford, Willys-Knight, Hudson and others, are increasing. Other miscellaneous consuming lines, chiefly household and bathroom hardware, are doing fairly well. Price quotations are adhered to in most instances, 1.55c and 1.65c, Pittsburgh, on wide and narrow hot and 2.25c to 2.35c, Cleveland, on cold.

Chicago — Despite sporadic releases of automotive tonnage in this district backlogs of cold-rolled strip have not changed materially. Much of the usual quota contracted has been closed on the basis of 2.25c to 2.35c, Pittsburgh-Cleveland.

Warehouse Sales Light but Some Factors Encourage

Warehouse Prices, Page 85

New York—While tonnage still is light, jobbers look for a moderate increase in buying as the month progresses. One feature is slackening of competition from the mills. Galvanized sheets are now 3.85c to 4.10c. Prices on other sheet descriptions are steady at respective ranges.

Philadelphia—Jobbers report a 10 per cent improvement in sales so far in January, compared with December daily average.

Pittsburgh—Sales show little change since the first of the year. Heavier products are in better demand than flat-rolled material. Roofing is dull. Prices are unchanged.

Buffalo—Warehouses report business showing a noteworthy improvement during the past week.

Cleveland—Movement of steel bars continues at the improved rate of a week ago, while some quarters report betterment in the movement of hot-rolled strip and manufacturers' wire. Prices continue firm.

Detroit—Warehouse sales are exhibiting a slightly better volume in January than in the prior month. Jobbers confidently derive from this a rather slow but certain recovery.

Chicago—A few spurts in warehouse steel buying have failed to clarify any definite trend. Some releases have been on orders held back until after inventories. Tonnage is fairly well diversified. Warehouse price of track bolts has been reduced to 4.30c from 4.55c. Railroad spikes have been reduced to one level of 3.40c for all sizes. Formerly, large spikes were quoted 3.55c, and small sizes at 3.65c.

Cincinnati—Improvement in sales over November and December has been slight. Dull market in structurals is especially noted. Quotations remain unchanged.

St. Louis—Purchasing of iron and steel goods from store is in seasonally small volume, though the past several days have witnessed a slight quickening in demand for tubing, and materials for railroad shops.

Operations Continue Gains; Now at 45 Per Cent Rate

Youngstown, O.—Operations of steel mills are up 5 points to 44 per cent this week. Newton Steel continues at 70 per cent, based on a large backlog of autobody sheet orders. Republic has blown in a stack at Massillon, Central Alloy division, and operations for all Republic plants are up 5 points to 35 per cent. Carnegie at 50 per cent is unchanged. Mahoning Valley Steel Co. resumes at 75 per cent capacity after 2-week layoff. Sharon Steel Hoop Co., ingot and strip rates are unchanged at 75 per cent for both, but sheet activities are advanced 10 points to 60 per cent capacity.

Sheet & Tube has advanced operations ten points to 45 per cent of capacity, expansion occurring at Brier Hill works where several open hearths, plate mill, electric-weld pipe mill, and other units are now active after long shutdown.

Open-hearth production is higher for independents with 21 melting against 18 last week.

Philadelphia—Ingot production in eastern plants is at 44 per cent capacity, a two point gain from last week. Plate production varies from 30 to 55 per cent capacities.

Pittsburgh—Ingot production is slightly higher at around 45 per cent. Finishing mill schedules show little change, sheet output holding about 40 and tin plate higher at 55 to 60. Strip and pipe mill operations continue at 35. Pittsburgh Steel Co. will light one of its two idle blast furnaces Jan. 15.

Buffalo — Fifteen open hearths are now making steel, representing 42 per cent of the district's capacity, compared with 46 per cent last week.

Cleveland—The 50 per cent ingot rate is continued, 17 of 34 open hearths pouring. Corrigan, McKinney is up this week to 8 furnaces, but has delayed indefinitely lighting of third blast furnace previously reported to be blown in last week.

Chicago—Steel ingot production is unchanged from last week at near 40 per cent, while only 12 of the district's 36 steelworks blast furnaces are active. Producers are picking up cold iron, and fair tonnage of pig iron is in stock.

Birmingham, Ala. — Ensley rail mill of the Tennessee Coal, Iron & Railroad Co. has resumed, five open-hearth furnaces being relighted at Ensley and six now being operated at Fairfield, Ala., Gulf States Steel has three open-hearths in operation at Gadsden. Operations are now around 58 per cent, compared with 35 last week.

Concrete Bars

(*Concluded from Page 67*)

Franklin streets, San Francisco, to unstated interest.

250 tons, Bekine warehouse, Glendale, Calif., to Concrete Engineering Co., Los Angeles.

205 tons, theater and hotel building, Davenport, Iowa, to Laclede Steel Co., St. Louis.

200 tons, Paulins Kill bridge, New Jersey, to Concrete Steel Co., New York.

170 tons, overcrossing and bridge, Bronx Parkway extension Westchester county, N. Y., to Concrete Steel Co., New York.

159 tons, highway work in Santa Barbara county, Calif., to unstated interest.

150 tons, Roosevelt high school, Washington, to Dietrich Bros., Baltimore; National Construction Co., Washington, general contractors.

150 tons, James Ford Rhodes high school, Cleveland, to Concrete Engineering Co., Chicago.

150 tons, Jefferson school, Santa Barbara, Calif., to unstated interest.

140 tons, Arsenal high school, Pittsburgh, to Metzger-Richardson Co., Pittsburgh.

125 tons, post office and court house, Clarksburg, W. Va. to Truscon Steel Co., Youngstown, O.

125 tons, postoffice and federal building, Clarksburg, W. Va., to Truscon Steel Co., Youngstown, O.

110 tons, service tunnel, Credemoore hospital, Long Island, N. Y., to Concrete Steel Co., New York; Williams Bridge Co., general contractor.

100 tons or more, foundations, Institute for Education of the Blind, Pelham Parkway, New York, to Igoe Bros., Newark, N. J.; I. B. Miller Inc., contractor.

100 tons, apartment, Hobart avenue near Fifth street, Los Angeles, to unstated interest.

100 tons, apartment, 445 South Gramercy place, Los Angeles, to unstated interest.

100 tons, overhead bridge, Oshkosh, Wis., to unstated fabricator.

Contracts Pending

17,300 tons, Hoover dam project, Denver; bids March 4.

5000 tons, another unit of sewage disposal plant, Chicago; bids being taken.

1000 tons, six state prison buildings, Attica, N. Y., bids in near future.

650 tons, Wards island anchorage, Triboro bridge, New York.

500 tons for Panama Zone, purchasing officer, Washington; bids Jan. 19.

350 tons, connecting link, sections 7, 7A and 8, contract No. 43, New Jersey; Guarantee Construction Co., New York, awarded general contract, foundations as caissons, on alternate bids.

200 tons, South high school addition, Cleveland; bids being taken.

200 tons, marine airport, Buffalo; bids in.

165 tons, city hall, Hammond, Ind.; general contract to Fleisher Engineering & Construction Co., Chicago.

150 tons, plant, Reserve Lithographing & Printing Co., East Ninth street, Cleveland; William R. Powell, architect.

200 tons, wire plant, General Electric Co., Cleveland.

Unstated tonnage, underground garage for city of Cleveland; plans being made.

Pipe

Utility Purchases Lead, 6500 Tons Bought in East—Smaller Cities Buy a Fair Aggregate

PIPE PRICES, PAGE 85

Chicago—Several utility companies are taking figures on 1931 cast pressure pipe needs. Whether more utility tonnage will be purchased than last year is not yet clear. Minneapolis placed a small tonnage of cast water pipe with American Cast Iron Pipe Co. Milwaukee has received bids for 500 tons of fittings. Prices are nominal in the absence of important buying. A budget figure of $21,785,000 is set tentatively for Chicago's 1931 water fund, and it is planned also to sell $3,000,000 in water certificates for construction.

Worcester, Mass.—Standard Oil Co. plans a $1,000,000 6-inch steel oil and gasoline pipeline from Providence, R. I., to Springfield and Worcester, Mass., to fork at Douglas. Work is to be done by its newly-acquired subsidiary, Magnolia Pipe Line Co. Springfield, 80 miles from Providence, is close to water level, while Worcester, 50 miles away, is 500 feet from sea level.

New York—Two eastern utilities closed on about 7000 tons of cast pipe. Bulk of first half buying by utility interests has been done. Prices are weak, under $35, eastern foundry, being more frequent. Foundries have stepped up production to 60 and 65 per cent. Bids are in on 2000 tons for the state hospital at Brentwood, L. I. This is in addition to sewer system needs, 225 tons. New York is expected in the market early in February for yard stocks, estimated at 6000 to 8000 tons.

An inquiry for 40,000 to 50,000 tons of steel line pipe for export is being figured here.

Philadelphia — Pennsylvania railroad closed bids Jan. 13 on 150 tons of steel pipe and 2500 tons of boiler tubes.

Cleveland—Pipe jobbers are not yet expanding their stocks. They order a carload now and then merely to keep their shelves well balanced. Operations continue around 35 per cent.

Pittsburgh — Demand for most tubular products is slow to improve. Distributors of standard pipe have little occasion to add to their stocks while requirements of oil country goods are restricted by light operations in the oil fields. Recent developments in the line pipe market have been productive of little tonnage. The Southern Fuel Co. has been formed by the Southern California Edison Co. and Southern California Gas Co. to construct a gas line in California although inquiry is not yet active.

Contracts Placed

5000 tons, various sizes of cast pipe, first half requirements, American Water Works & Electric Co., New York, to United States Pipe & Foundry Co., East Burlington, N. J.

1675 tons, 30-inch class D cast pipe for Ross Island improvement project, Portland, Oreg., to United States Pipe & Foundry Co., Seattle.

1500 tons, various sizes of cast pipe, for Consolidated Gas Co., Baltimore, to R. D. Wood & Co., Florence, N. J.

875 tons or more, castings, etc., for supply department, Boston, as follows: 200 tons castings and fittings, to Johnson City Foundry, New York; 200 tons 2-part boxes, to Central Foundry Co., New York; 100 tons frames and covers and 100 tons pipe stock, to LeBaron Foundry Co., Brockton, Mass.; 100 tons special castings, to Gibby Foundry Co., East Boston; 175 tons, gate and hydrant castings, to Mechanics Iron Foundry, Boston, and special castings for high pressure lines, to D. H. Walton & Co. Inc., New York.

576 tons, 8300 lineal feet of 16-inch cast pipe for Bean Hill improvement project, Seattle, to French interests; J. Argentieri, general contractor.

400 tons, 20 to 48-inch cast pipe and special castings, mostly latter, for Queens, N. Y., to United States Pipe & Foundry Co., East Burlington, N. J.; Oakhill Construction Co., general contractor.

400 tons, 20-inch centrifugal cast pipe for El Paso, Tex., to American Cast Iron Pipe Co., Birmingham, Ala.

285 tons, 6 to 20-inch, cast pipe, for New York, to United States Pipe & Foundry Co., East Burlington, N. J.; J. V. Timoney Construction Co., general contractor.

143 tons, 4 to 10-inch class B cast pipe for Inglewood, Calif., to National Cast Iron Pipe Co., Birmingham, Ala.

122 tons, 4 and 6-inch cast pipe for Chehalis, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

Unstated tonnage, 3000 feet, various sizes, water pipe, for Panama, to R. D. Wood & Co., Florence, N. J.

Steel Pipe Orders

5000 tons of steel pipe, water distribution system, Queens, N. Y., to Alco Products Co. Inc., division of American Locomotive Co., Dunkirk, N. Y.

1000 tons, up to 14-inch, tunnel connections, heating and appurtenant works, Pilgrim State hospital, Long Island, N. Y., to Republic Steel Corp., Youngstown, O.; R. H. Baker Co., general contractor.

Contracts Pending

2500 tons, 6 to 30-inch cast pipe for Portland, Oreg.; bids in.

2000 tons, up to 18-inch, mostly 12-inch

STEEL CLIMBS HIGH

UP AND UP . . fifty, sixty, seventy, eighty-five floors . . climbed the steel for the world's highest structure, the Empire State Building in New York City. The enormous investment of 55 million dollars in this mammoth building made it imperative that construction be speeded to a pace never before equalled. More than 50,000 tons of steel to be rolled, milled, fabricated and erected between March and September! C B's (Carnegie Beams) were selected for the job. In this crowded section of the city there was little space for temporary storage of steel beams. Shipping schedules had to be worked out and accurately timed. Very often the girders were lifted from the delivery trucks to their proper place in the structure!

Exceptionally heavy construction was required to carry the enormous load. The heaviest C B column section weighs 425 pounds per foot. For the main columns on the lower floors these sections were built up by fabrication to weigh 2357 pounds per foot!

Whether the job be large or small, the wide parallel flanges of C B sections present distinct advantages to the architect, engineer and builder. They will climb as high as man finds it economically desirable to build. 112

U S STEEL

CARNEGIE STEEL COMPANY »» PITTSBURGH

Subsidiary of United States Steel Corporation

cast pipe for state hospital, Brentwood, L. I., water system; bids in; 225 tons of 6 and 12-inch for sewerage still pending; general contract awarded.

1217 tons, 6 to 20-inch class B cast pipe for Oakland, Calif.; bids opened.

694 tons of 6-inch and 159 tons of 8-inch cast pipe for Mansfield, Mass.; to be voted upon at March town council meeting.

350 tons of 6 to 16-inch special castings, 90 tons offset pipes, class D, 4 to 16-inch, and 70 tons tapping sleeves, 6 to 16-inch, for Milwaukee, to be used in connection with 6000 tons of 6 to 16-inch class C pipe, already awarded to United States Pipe & Foundry Co., East Burlington, N. J., as noted in STEEL of Jan. 8; to be readvertised; bids close Jan. 13.

100 tons, 8-inch cast pipe and fittings for Freeport, N. Y.; bids in; Clyde Potts, consulting engineer.

Unstated tonnage, 14 miles of 6 and 8-inch cast water pipe for Templeton, Mass.; to be voted upon soon.

Steel Pipe Pending

40,000 to 50,000 tons, steel line pipe for export, current in New York.

150 tons steel pipe, Pennsylvania railroad, with 2500 tons boiler tubes; bids opened Jan. 13.

Semifinished Still in Moderate Demand

Semifinished Prices, Page 74

Pittsburgh — Shipments of semifinished steel generally lack improvement, reflecting continued light operations of some finishing mills. New business is slightly more active although orders usually are for small lots. Producers generally quote $30, Pittsburgh, for rerolling billets, slabs, and sheet bars on new tonnage, while forging billets command $36. Wire rods are $35.

Chicago — A moderately heavy semifinished steel tonnage is being contracted. Small billets and blooms, 4 x 4-inch base, are $31 to $32, Chicago. Sheet bars are $31.

Cleveland—Specifications continue to gain moderately, the leading merchant producer here adding another open hearth. Eight units are active out of 14. New orders are small. Sheet bars, billets and slabs are $30, base, Cleveland and Youngstown, O.

Philadelphia — New business in billets shows rerollers now are $30 to $31, base, Pittsburgh. Forging billets are $35 to $36.

Youngstown, O.—Consuming mills adhere closely to the rule of buying only for immediate needs. Producers this week have 23 independent open-hearth furnaces active out of a district total of 53 units. A slight expansion in sheet and strip mill operations this week accounts for the increase in open-hearth operations compared with last week.

Wire

Specifications Make Moderate Gains with Prices Holding Firmly—Prospects Are Better

WIRE PRICES, PAGE 63

Chicago—Moderate gains in common wire products tonnage are noted, without indication of their being sustained. Western mill operations remain at 35 to 40 per cent. Minor gains in monthly tonnages are expected until May or June, when prospects are for a more marked upturn. A fair total of contract business has been taken on the basis of $1.95, Chicago or western mills, for wire nails, and 2.25c to 2.35c for plain wire.

Worcester, Mass.—Production remains stationary. There is little to indicate as yet that buyers are ordering more than inventory requirements. There was a slight gain last week, due mainly to replacing depleted year-end stocks, but no substantial gains have been recorded. Plain bright wire to dealers is firm at 2.40c, base, Worcester.

New York—Nails are unchanged at $1.90, Pittsburgh, to jobbers, and $2 to the general trade. Plain bright wire has settled to a general level of 2.20c, Pittsburgh. Trading continues slack.

Philadelphia—Wire and nails are firmer, plain manufacturers' wire being 2.30c, Pittsburgh, and nails $1.90, Pittsburgh. Indications give hope of improvement in wire demand. Wire rod specifications are better against first quarter contracts at $35, Pittsburgh.

Pittsburgh — Specifications for wire products continue to improve slowly. Prices show a steadier tone with fewer reports of shading. The market generally is $1.90 and $2 for wire nails, 2.20c to 2.30c for plain wire, and $35 for wire rods. Orders are fairly well distributed although increase in automotive requirements so far is light. Jobbing products still are moving slower than the seasonal rate.

Cleveland—A continued steady betterment is noted in the wire market. Local jobbers are releasing their tonnages on books in heavier volume. Likewise, nail shipments are gaining. The betterment in general manufacturing and industrial activity in the past two weeks is held responsible for the increase and sellers attribute change also to universally small stocks in jobbers' and manufacturers' hands as 1930 closed. Wire nails are $1.90 and $2.00; plain wire and spring wire are also unchanged at 2.20c-2.30c and 3.20c, respectively. In semifinished, wire rods are $35, Pittsburgh.

Bolt, Nut, Rivet Demand Shows Fair Increase

Bolt, Nut, Rivet Prices, Page 63

Pittsburgh—Demand for bolts, nuts, and rivets shows further improvement. Requirements of railroads are increasing and specifications are coming from a number of users who have been out of the market for many weeks. Demand still is seasonally light but represents the first upward turn in several months. Operations are unchanged at about 35 per cent. Prices continue 73 off for bolts and nuts and 2.75c, Pittsburgh, for large rivets.

Philadelphia—Bolts and nuts are generally 73 off list, with additional discounts on occasional desirable specifications. Some warehouse distributors are sharply critical of this shading, believing it may have a demoralizing effect. Rivets are shaded occasionally on large lots of structural rivets. The price generally is 2.75c, Pittsburgh.

Chicago — Distributors of bolts, nuts and rivets are encouraged by the fact that January is holding to the December pace despite irregular implement and tractor production and only moderate automotive buying. It is expected some of the implement works will be obliged to start production schedules soon for spring. Bolts and nuts are unchanged at discounts of 64 to 73 off.

Cold-Finished Bar Sales' Increases Are Slight

Pittsburgh — Cold-finished steel bar demand is steady, but light. The improvement in automotive operations has resulted in only a mild pickup in bar specifications, orders being limited to small lots for early requirements. Demand from miscellaneous consumers also is on a hand-to-mouth basis. Most tonnage is covered by contracts though the market is steady on new orders at 2.10c.

Tractive power of locomotives has been increased from 28,305 pounds in 1911 to 44,798 pounds in 1929.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$17.50
Pittsburgh, district fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Valley, furnace	17.00
Cleveland fur., local del.	17.50
Philadelphia, delivered	17.76
Virginia, furnace	17.75
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail, Brooklyn	20.41 to 20.91
Buff., all-rail, Newark	18.28 to 18.78
Ala., Bir. fur., local del.	14.00
Alabama, del. Chicago	17.01 to 17.51
Alabama, del. St. Louis	14.92 to 15.42
Alabama, del. Cincinnati	14.69 to 16.19
Alabama, del. Cleveland	16.51 to 17.51
Ala., Phila., dock del.	16.25
Ala., Balt., dock del.	16.00
Alabama, New York dock	16.00 to 16.50
Ala., Boston dock del.	16.25 to 16.75
Tenn., Bir. base, local del.	14.00
Tennessee, del. Cinn.	14.69 to 16.69
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	18.00
Buff., all-rail, Brooklyn	20.91 to 21.41
Buffalo, all-rail Newark	18.78 to 19.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	18.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	19.00
Eastern, del. Phila.	19.26

MALLEABLE

Valley furnace	17.50
Cleveland fur., local del.	17.50
Pittsburgh district fur.	18.00
Pittsburgh, delivered	18.63 to 19.13
Valley furnace	17.50
Buffalo fur., local del.	18.00
Eastern Penna., delivered	18.26 to 20.91
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Eastern Penn., del.	17.25 to 17.75
Buffalo fur., local del.	17.00
Montreal, delivered	20.50
Valley furnace	17.00

BESSEMER

Valley furnace	17.50
Pittsburgh, delivered	18.63 to 19.13
Pittsburgh, furnace	18.00

LOW PHOS.

Valley fur., standard	27.00
Philadelphia, standard	24.76 to 28.79
Copper-bear., E. Pa. fur.	22.50 to 23.00

GRAY FORGE

Valley furnace	16.50
Pittsburgh district fur.	17.00
Pittsburgh, delivered	17.63 to 18.13

CHARCOAL

Lake Superior, del. Chi.	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$33; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.50 to 2.60
Connellsville foundry	3.25 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell. basis	5.50
Buffalo ovens	8.00 to 8.50
Detroit, ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports	
Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.00
North African low phosphorus	9.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish, North African basic, 50 to 60%	9.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$11.50 to 12.00
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.50

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 to 28 cents
South African, 52-53%	24 to 26 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	23 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

PRICES PER GROSS TON

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$30.00
Pittsburgh, bessemer	30.00
Youngstown	30.00
Cleveland	30.00
Philadelphia	35.30 to 36.30
Chicago	31.00 to 32.00
Forging, Chicago	36.00 to 37.00
Forging, Pittsburgh	36.00
Forging, Philadelphia	40.30 to 41.30

SHEET BARS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00
Chicago	31.00

SLABS

Pittsburgh	30.00
Youngstown	30.00
Cleveland	30.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.79
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon. cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one-ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

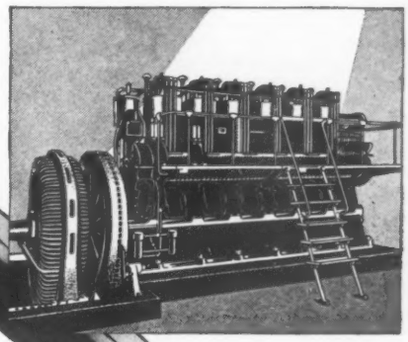
Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$16.00
Washed gravel, import duty paid east, tide, gross ton	19.50

$1.00 WORTH OF NICKEL MAKES THIS

$10,000 DIESEL PERFORM BETTER LONGER



Just the price of a few quarts of oil... that's the cost of the small amount of Nickel needed to give a set of Diesel engine piston rings increased wear-resistance and smoother performance.

Cast iron alloys containing Nickel are also used for cylinders and other engine parts to prevent vital parts from grinding themselves into obsolescence.

When added to cast iron, steel, stainless steel, brass, bronze or aluminum, Nickel imparts one or more of these desirable properties: (1) grain refinement; (2) increased hardness; (3) improved wear-resistance; (4) strength and toughness at elevated temperatures.

Nickel alloys "perform better longer." Why not let our engineers suggest how and where they will fit into your plans for product improvement?

Send for Bulletin 206—"Data on Wear-Resistance and Machinability of Cast Iron."

THE INTERNATIONAL NICKEL COMPANY, INC.

Miners, Refiners, and Rollers of Nickel.
Sole Producers of Monel Metal

67 Wall Street **New York, N. Y.**

Nickel
ALLOYS
PERFORM BETTER LONGER

Pig Iron

Small Tonnages Predominate in Market—Shipments Continue To Show Improvement

PIG IRON PRICES, PAGE 74

Pittsburgh—Sales of pig iron are disappointing. Activity in the market has improved only slightly since the first of the year. Foundry operations are slow to expand and steel company purchases are lacking. Orders rarely are for more than 200 to 300 tons at a time, despite the general low level of consumers' stocks. Shipments are increasing mildly and are insufficient to warrant any large expansion in furnace operations which continue at last year's lowest level. Prices are receiving a test of only small lots but occasional reports of shading are heard.

Boston—Foundries in New England are not working more than four days a week. Many are working less than four days. Demand for iron is quiet, only 1200 tons being booked in the past week by all sellers in this district. General Electric Co. is inquiring for 600 tons, to be divided between its Everett, Pittsfield and Lynn, Mass., plants.

New York—Pig iron sales totaled approximately 4000 tons in the past week. Orders included 450 tons for the American Locomotive Co., Schenectady, N. Y., and 200 tons for the Cincinnati plant of the Worthington Pump & Machinery Corp. The Thatcher Furnace Co., it now develops, closed recently on 3000 tons, instead of 1000 as reported. The iron is for plants at Newark and Garwood, N. J. Prices appear slightly firmer. Except for tonnage going into the northern New Jersey district, where $15 to $16, furnace, applies, Buffalo iron in the metropolitan territory is $15.50 to $16, furnace, with one large producer quoting a firm price of $16.

Philadelphia—Further heavy buying of basic iron featured the market in the past week. This grade now is $17.25 to $17.50, delivered in this territory. The foundry iron market is quiet and the price is unchanged at $17, base, eastern Pennsylvania furnace. Occasional small sales of southern iron are noted at $11, base, Birmingham, equivalent to $16.25, delivered, Philadelphia dock, and nothing now is heard of $10, base, Birmingham, or $14.85 delivered, Delaware river dock, at which price a pipemaker bought iron several months ago. Recent purchases include one lot of about 5000 tons of Massachusetts iron by a Delaware river pipe plant. Slightly more than 15,000 tons of Indian pig iron was imported here in December, including basic and foundry. Indian foundry iron now is $18, duty paid, Philadelphia docks for the base grade.

Buffalo—Pig iron shipments have improved over December, which was the worst month in many years from this standpoint. There has been no inquiry of sufficient size to test reported firmness of prices. Sales in the week totaled 1000 tons.

Youngstown, O.—Pig iron demand is confined to small lots of No. 2 foundry and malleable. No. 2 foundry holds at $17, valley, and malleable and bessemer at $17.50. The Republic Steel Corp. lighted its Central Alloy blast furnace at Canton, O., Jan. 9, but will not relight its Trumbull-Cliffs stack at Warren, O., until some time before Feb. 1.

Cleveland—Pig iron shipments are improving steadily. One interest shipped more iron in the past week than in any similar period in the last four months. Bookings by furnace interests with headquarters in Cleveland totaled 12,000 tons in the week, compared with 8500 tons in the week preceding. Current inquiries are small. Cleveland furnaces hold to $17.50, base, for local delivery and $16 minimum for outside shipment. Competition is a little keener in outside territory. Corrigan, McKinney Steel Co., Cleveland, has not lighted a third stack, as reported contemplated last week.

Chicago—The present position of the pig iron market is reversed from that in late December when tonnage sales picked up and small orders lagged. Now small lots feature the market. Automotive inquiries from western Michigan are heavier. Several of the larger users who closed in December are expected to buy again soon. One or two implement makers are asking for heavier shipments. It is understood $10.50, base, Alabama furnace, can be done on attractive tonnages. The northern furnace price is steady.

Cincinnati — Activity in the pig iron market is increasing, sales amounting to 4000 tons, one of the best weeks in several months.

St. Louis—Pig iron sales are small, expected purchasing of basic not having developed. Many melters still are taking inventory.

Birmingham, Ala.—One furnace interest here is reported to have booked an order for 20,000 tons for delivery in three to six months. Other sales are numerous but limited to small lots.

Toronto, Ont.—Merchant pig iron sales show minor improvement. The daily melt is holding around 35 to 50 per cent, with prospects for an increase of about 10 per cent within the next month or six weeks.

Ferroalloys Reflect Gain in Steel Operations

Ferroalloy Prices, Page 74

New York—Reflecting improvement in steelworks operations shipments of ferromanganese are slightly better. The price continues $85, duty paid, for carload lots. Domestic spiegeleisen is more active at $30, furnace, for the 19 to 21 per cent grade.

Shipments of special ferroalloys are more active than last month. Most users are under contract for 1931. Prices are steady. Tungsten continues dull and nominal, with ferro $1.10 to $1.15 a pound contained, and wolframite $3.50 to $4 a short ton unit in bond, the lower figure being the more general, $11.50 to $12, duty paid.

Pittsburgh—Shipments of ferromanganese and spiegeleisen have improved but little since the first of the month although heavier shipments are in prospect. The market continues $89.79, delivered, for ferromanganese and $30 for spiegeleisen. Both prices apply on small lots. Prices on other ferroalloys generally are steady.

Chicago—An inquiry is current for 500 to 1000 tons of spiegeleisen for a railroad equipment manufacturing company.

Cinder and Scale Lower; Market Is Lacking

Philadelphia—For the first time in years there appears to be no real market for mill cinder and scale, because so few eastern merchant blast furnaces are operating. Nominally cinder is $2.75 to $3 a gross ton, delivered, eastern Pennsylvania furnaces, or 50 cents lower than a year ago. Scale is nominally $4.50 to $5 a gross ton, delivered, eastern Pennsylvania blast furnaces, which is about $1 less than a year ago. So far, little cinder and scale has been sold for 1931 and there is little market for even the present reduced rate of production of cinder and scale.

Scrap

Prices Show Upward Tendency but Buying Is Not Heavy—Slow Gains in Melt Being Made

Chicago—Owing to higher prices paid recently by dealer interests for some iron and steel scrap grades offered by railroads, several consumer quotations have been revised moderately upward. Sentiment in eastern scrap markets has failed to impart appreciable strength in this territory. Dealers' unfilled orders are light, but melters, restricted by huge reserves, are slow to commit themselves. It is indicated that larger melters would be sustained on existing reserves for 60 to 90 days without fresh purchases. Heavy melting steel remains at $10 to $10.50, despite the fact that secondary grades were sold to a local mill in small tonnage at $10.25. Virtually two grades have been set up, one based on the present market

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	9.50 to 11.00
Boston, dealers	6.50 to 7.00
Buffalo, No. 1	10.75 to 11.25
Buffalo, No. 2	9.25 to 9.75
Chicago	10.00 to 10.50
Cinci., deal.	9.50 to 10.00
Cleve., No. 1	10.25 to 10.75
Cleve., No. 2	9.75 to 10.25
Det., No. 1 deal.	9.50 to 10.00
Det., No. 2 deal.	7.00 to 7.50
E. Pa. del. mill	10.00 to 11.00
N. Y. del. R. R.	7.00
N. Y. deal. No. 2	5.50
N. Y., deal. yd.	5.50
Pitts., No. 1	13.00 to 13.50
St. L. No. 1 sel.	10.50 to 11.00
Federal, Ill.	9.75 to 10.25
Granite C., Ill.	9.00 to 9:50
Valleys, No. 1	12.50 to 13.00

COMPRESSED SHEETS

Buffalo, dealers	9.25 to 9.75
Chicago	8.50 to 9.00
Cleveland	9.00 to 9.50
Detroit, dealers	9.00 to 9.50
E. Pa. new mat.	9.00 to 10.00
Pittsburgh	12.50 to 13.00
Valleys	12.00 to 12.50

BUNDLED SHEETS

Buffalo	7.00 to 7.50
Cinci., deal.	8.75 to 9.25
Cleveland	7.00 to 7.50
Eastern Pa.	9.00
Pittsburgh	10.00 to 10.50
St. Louis	5.50 to 6.00

SHEET CLIPPINGS LOOSE

Chicago	5.50 to 6.00
Cincinnati	5.00 to 5.50
Detroit, dealers	6.00 to 6.50
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	12.00 to 12.50
Boston, dealers	5.50 to 7.00
Buffalo	13.75 to 14.25
Chicago (3 ft.)	12.25 to 12.75
Chicago (2 ft.)	12.75 to 13.25
Cinci., deal.	15.50 to 16.00
Detroit, deal.	12.50 to 13.00
Pitts. (open-hearth, 3 ft. and less)	14.50 to 15.00
St. Louis	13.50 to 14.00

STOVE PLATE

Birmingham	8.00 to 8.50
Boston, con.	8.00 to 8.50
Buffalo	9.00 to 9.25
Chicago, net	7.75 to 8.25
Cinci., deal. net	5.25 to 5.75
Det., net, deal.	6.25 to 6.75
Eastern Pa.	9.00 to 9.50
N. Y., deal. mill	4.75
St. Louis	8.00 to 8.50

COUPLERS, SPRING

Buffalo	13.50 to 14.00
Chicago	12.00 to 12.50
Eastern Pa.	16.50
Pittsburgh	16.00 to 16.50
St. Louis	11.00 to 11.50

ANGLE BARS—STEEL

Chicago	11.75 to 12.25
St. Louis	9.50 to 10.00

LOW PHOSPHORUS

Buff., billets and bloom crops	15.00 to 15.50
Cleveland bil. and bloom crops	16.50 to 17.00
Eastern Pa.	17.00
Pittsburgh billet bloom crops	17.00 to 18.00
Pitts. sheet bar crops	16.50 to 17.00

FROGS, SWITCHES

Chicago	10.75 to 11.25
St. Louis	11.00 to 11.50

SHOVELING STEEL

Chicago	10.00 to 10.50
Cleveland	6.75 to 7.25
St. Louis	9.50 to 10.00

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	8.50 to 9.00
Buffalo, No. 2	11.00 to 11.50
Chicago, No. 1	9.50 to 10.05
Chicago, No. 2	10.00 to 10.50
Cinci., No. 2	9.50 to 10.00
Eastern Pa.	13.50
N. Y., No. 1 deal.	10.00 to 10.50
Pitts., No. 2	13.00 to 13.50
St. Louis, No. 1	7.75 to 8.25
St. Louis, No. 2	9.50 to 10.00

SPECIFICATION PIPE

Boston	6.50 to 7.00
Eastern Pa.	11.50 to 12.00
N. Y., deal.	7.25 to 7.50

BUSHELING

Buffalo, No. 1	9.25 to 9.75
Chicago, No. 1	8.50 to 9.00
Cinn., No. 1 dl.	8.00 to 8.50
Cinn., No. 2	4.50 to 5.00
Cleve., No. 2	6.00 to 6.50
Det., No. 1 new deal.	8.25 to 8.75
St. L., No. 1	7.00 to 7.50
Val. new No. 1	11.50 to 12.00

MACHINE TURNINGS

Birmingham	7.00 to 8.00
Boston, dealers	2.00 to 2.50
Buffalo	6.00 to 6.50
Chicago	4.25 to 4.75
Cinn., deal.	4.50 to 5.00
Cleveland	4.75 to 5.25
Detroit	3.75 to 4.25
Eastern Pa.	7.00 to 7.50
N. Y., deal.	3.00
Pittsburgh	6.00 to 6.50
St. Louis	4.00 to 4.50
Valleys	6.00 to 6.50

BORINGS AND TURNINGS For Blast Furnace Use

Boston	2.00 to 2.60
Buffalo	6.50 to 7.00
Cinn., deal.	4.50 to 5.00
Cleveland	6.75 to 7.25
Detroit, deal.	5.25 to 5.75
Eastern Pa.	6.00 to 7.00
N. Y., deal.	3.00
Pittsburgh	7.75 to 8.25

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	7.00 to 8.00
Boston, chem.	9.10 to 9.60
Boston, deal.	2.00 to 2.50
Buffalo	6.50 to 7.00
Chicago	5.50 to 6.00
Cinn., deal.	4.50 to 5.00
Cleveland	6.75 to 7.25
Detroit, deal.	5.25 to 5.75
Eastern Pa.	7.00 to 7.50
E. Pa., chem.	13.50 to 14.50
N. Y., deal.	3.50
Pittsburgh	7.75 to 8.25
St. Louis	6.00 to 6.50

PIPE AND FLUES

Cinn., deal.	7.50 to 8.00

RAILROAD GRATE BARS

Buffalo	7.00 to 7.50
Chicago, net	7.00 to 7.50
Cincinnati	7.00 to 7.50
Eastern Pa.	9.00 to 9.50
N. Y., deal.	6.00
St. Louis	7.50 to 8.00

FORGE FLASHINGS

Boston, deal.	6.00 to 6.25
Buffalo	9.25 to 9.75
Cleve. ov. 10 in.	9.00 to 9.50
Detroit	8.00 to 8.50

FORGE SCRAP

Boston, del.	5.50 to 6.00
Chicago	13.50 to 14.00
Eastern Pa.	11.00

ARCH BARS, TRANSOMS

Chicago, net	11.50 to 12.00
St. Louis	11.50 to 12.00

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	10.50 to 11.00
Chi., steelworks	6.50 to 7.00
Cleveland	9.50 to 10.00
Eastern Pa.	11.00
Pittsburgh	10.50 to 11.00
St. Louis	7.50 to 8.00

STEEL CAR AXLES

Birmingham	14.00 to 14.50
Boston, ship. pt.	14.00 to 15.00
Buffalo	15.50 to 16.00
Chicago	11.75 to 12.35
Eastern Pa.	18.50 to 19.50
St. Louis	14.50 to 15.00

SHAFTING

Bos., ship. pt.	13.00 to 13.50
Chicago	12.90 to 13.45
N. Y., deal.	13.00 to 14.00
St. Louis	12.00 to 12.50
E. Penna.	18.00

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	13.50 to 14.00
Chicago, iron	11.50 to 12.00
Chi., roll steel	13.75 to 14.25
Cincinnati, iron	10.50 to 11.00
E. Pa. steel	15.50 to 16.00
E. Pa. iron	13.50 to 14.00
Pitts., iron	13.75 to 14.25
Pitts., steel	16.00 to 16.50
St. Louis iron	10.50 to 11.00
St. Louis, steel	13.25 to 13.75

NO. 1 CAST SCRAP

Birming., cup.	9.50 to 10.00
Buffalo (mach.)	10.00 to 10.75
Boston, textile	11.50 to 12.00
Chicago, mach.	10.65 to 11.20
Chi., railroad	10.10 to 10.65
Chicago, agri.	9.50 to 10.10
Cinn., mach. cup., gross	13.50 to 14.50
Cleve. cupola	12.00 to 12.50
Det., net deal.	8.50 to 9.00
E. Pa. cupola	13.00
N. Y. cup. deal.	8.00 to 8.50
N. Y., del. local foundries	14.00
Pitts., cupola	12.50 to 13.00
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 ma.	9.75 to 10.25
St. L. No. 1	9.00 to 9.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast.	11.50 to 12.50
Buffalo, break	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto, net deal.	10.50 to 11.00
Det., break., dl.	6.50 to 7.00
Eastern Pa.	11.00
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	7.00 to 8.00
Pittsburgh	10.50 to 11.00

MALLEABLE

Boston R. R.	13.00 to 13.50
Buffalo	12.50 to 13.00
Chicago, agri.	11.00 to 11.50
Chicago, R. R.	12.75 to 13.25
Cinn., R. R. dl.	12.00 to 12.50
Cinn., agri., dl.	12.00 to 12.50
Cleve., rail	12.50 to 13.00
Det. auto deal.	11.00 to 11.50
St. Louis, rail	10.50 to 11.00

RAILS FOR ROLLING 5 feet and over

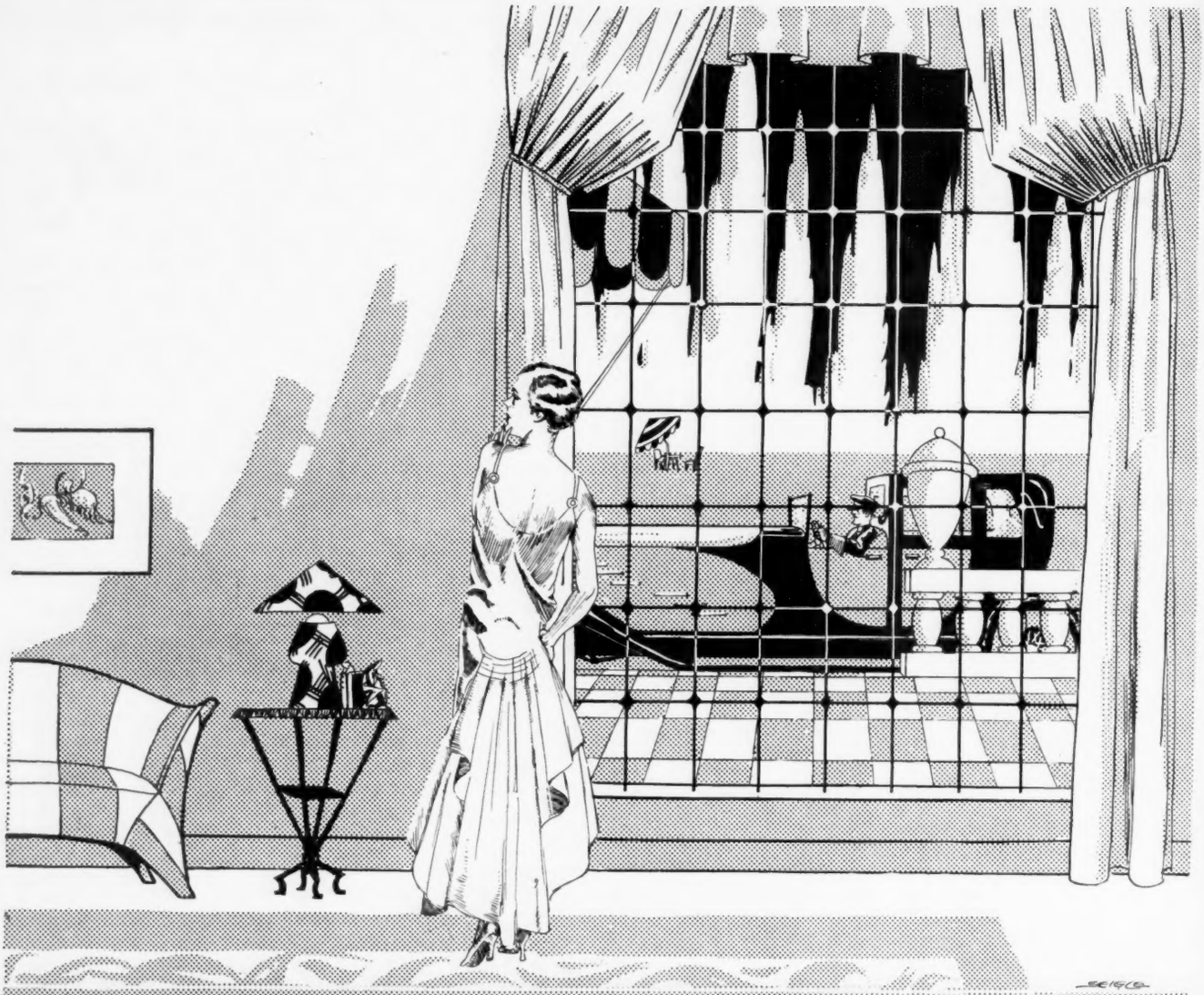
Birmingham	11.25 to 11.50
Boston	8.50 to 9.00
Buffalo	10.00 to 10.50
Chicago	13.00 to 13.50
Eastern Pa.	13.00 to 13.50
New York	9.50 to 10.00
St. Louis	11.25 to 11.75

LOCOMOTIVE TIRES

Chicago, cut	13.00 to 13.50
St. L. No. 1	11.00 to 11.50

LOW PHOS. PUNCHINGS

Chicago	12.00 to 12.50
Buffalo	14.00 to 14.50
Eastern Pa.	15.50 to 16.50
Pittsburgh	15.50 to 16.50



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at $10.50 and the other at $10.25.

Boston—Better sentiment in the steel and iron scrap market has followed some buying by Pittsburgh melters. This has strengthened prices somewhat.

New York—While new business is lacking, resumption of shipments against contracts at some plants has given the scrap market a livelier aspect. A Claymont, Del., consumer of No. 1 railroad steel has resumed shipments against contracts placed some time ago. Dealers' buying prices are unchanged.

Philadelphia — Another purchase of several thousand tons of No. 1 heavy melting steel during the past week at $11, delivered, holds the market at $10 to $11. Increased buying in the Pittsburgh district is having effect here and dealers have sold considerable eastern scrap in the past week for shipments to Pittsburgh at good prices, hydraulic bundles of new sheet scrap at $12.50, delivered, Pittsburgh. Altogether considerable tonnage of miscellaneous scrap is involved in the past week's buying.

Buffalo—There has been no new buying of scrap and only one large consumer is taking deliveries of heavy melting steel. Prices are nominal and deliveries slow. Dealers hear unofficially embargoes will be lifted about Jan. 20.

Cleveland—One local steelworks is taking a few cars of iron and steel scrap weekly, but this is against orders placed several months ago and has no buoyant effect. Foundry consumers are more active and this has resulted in increased demand for specialty grades. Quotations, however, remain at recent low levels. Activity continues to lag in the Youngstown district.

Detroit—While there has been no buying of steel and iron scrap dealers have had to scramble in some cases to obtain material for their orders. The market is on a firmer basis and blast furnace grades and compressed sheets are held 25 cents higher.

Cincinnati—Shipments of iron and steel scrap remain at a low mark, with mill demand showing little improvement. New business is so scarce dealers are hesitant about buying unless for contract, and prices are so low as to prove unattractive to producers. Quotations are nominal and unchanged.

St. Louis—Despite the fact that actual purchasing of steel and iron scrap is in moderate volume, the market has a steady undertone. Melters are quietly seeking bargains. On real tonnages, however, melters are holding off, and are unwilling to sell.

Birmingham, Ala.—Little tonnage is moving but dealers expect improvement soon. One melter has been bringing supplies from another district. Stocks of consumers are low.

Toronto, Ont.—Consumers are beginning to show more interest in the steel and iron scrap market. Sales, while confined to small tonnages, are more numerous. No large spot orders or future delivery contracts have been placed, however.

Pittsburgh—Prices of steel and iron scrap fail to gain strength. Most mills have entered the market since the first of the year but for only moderate tonnages. Recent purchases of heavy melting steel have been at $13 and $13.50 while compressed sheets have sold at $12.50 to $13. Outlook for additional buying is clouded by uncertainty of future steelmaking operations.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Coke

Foundry Grades in Fairly Active Market—Demand for Furnace Fuel Continues Light

COKE PRICES, PAGE 74

Pittsburgh—Demand for beehive furnace coke continues dull, while that for foundry grades maintains its recent improvement. The spot market for the former is holding at $2.50. Foundry fuel quotations also are steady. Sales of heating fuel are seasonally light.

Beehive coke production in the Connellsville district during the week ending Jan. 3 was 13,640 tons against 13,850 tons the preceding week and 24,410 tons the corresponding week of last year, according to the *Connellsville Courier*.

Boston—Ovens are working at capacity, mainly on domestic grades. Little prospect is noted for improvement in foundry business.

New York—With inventory over, moderate improvement in demand for metallurgical coke is indicated. Prices continue $2.50 to $2.65, Connellsville, for furnace coke; $3.50 to $3.75, Connellsville, for standard foundry grades, and $4.70 to $4.85, Latrobe, Pa., for premium foundry grades. Cold weather has reduced stocks of by-product coke considerably. Prices on this fuel are $9 to $9.40, Newark, N. J.; $11, New England; and $9, Philadelphia.

St. Louis—Specifications have increased moderately. Melters are ordering only enough to cover requirements from week to week. Prices are unchanged.

Cincinnati—Heavier specifications for by-product coke indicate a better melt in some quarters and in others a replenishing of depleted stocks. New business includes a 500-ton order.

Birmingham, Ala.—Demand is showing a little more life. Nearly 500 of the 1300 by-product ovens in this district were idle for three or four weeks but are slowly resuming operations.

Refractory Sales Light Mostly for Repairs

Refractories Prices, Page 74

Pittsburgh—Sales of refractory material show little improvement over the slow December rate. Little new construction work is in sight for the steel industry but a number of blast furnaces, stoves, open hearths, and other steel plant equipment are in need of repairs.

Poor engagement of steel plants during the latter part of 1930 has curtailed the necessity of a large amount of relining work out some equipment that has been idle during recent months will require attention.

Most orders for refractory brick are for prompt shipment, stocks of users being light. Prices remain steady at $43 for first quality fire clay and silica brick with second quality fire clay material quoted $35 to $38. Magnesite brick is $65.

Pacific Coast

Tonnage in Northwest in 1930 Held Fairly Near That of 1929 —Cast Pipe and Concrete Bars Made Record—Small Tonnages the Rule This Year—Prices Are Holding Fairly Firmly

Seattle—Steel products placed in the Pacific Northwest during 1930 show a total of 139,093 tons, compared with 151,557 tons in 1929 and 132,000 tons in 1928. Last half showed a gain over the first six months, 77,403 tons compared with 61,690. The record indicates that notwithstanding unfavorable conditions this section purchased a normal volume of steel products last year. Compared with 1929, last year's record shows that there was a gain in concrete bar and cast iron pipe business while both plates and shapes tonnages were less.

Bars, Plates and Shapes

Local mills have resumed open-hearth operations after the holiday shutdown. Considerable work is on books but recent awards for concrete bars have been in lots of less than 100 tons. This material is unchanged at 2.30c. There is small demand for merchant bars. The mill price is 2.30c. Tonnages pending for reinforcing material are below normal. Two concrete bridges are included in bids to be received by the highway departments of Washington and Idaho this month.

No important plate projects have developed and contracts pending do not involve large tonnages. Mill prices are nnchanged at 2.10c up.

Only one structural award was announced this week, 210 tons for a warehouse at the Puget Sound Navy yard, taken by the Star Iron Works, Tacoma, Wash., through Fitten & Livergreen, Seattle, general contractors. The general contract for a 4-story telephone building at Tacoma has been awarded. This project requires 100 tons of concrete bars and 600 tons of shapes. Bids have been received at Tacoma for the Puyallup river bridge, including 315 tons of structurals. Bids for reconstructing the Hawthorne bridge at Portland, Oreg., will be opened Jan. 12. A small state bridge in Whatcom county, Wash., calling for 105 tons, is pending.

Finished Materials

Wholesale jobbers have begun the new year with unchanged price lists and no revision is anticipated. Not sufficient imported steel is arriving to upset local conditions. Business is generally on a hand-to-mouth basis and has developed no activity thus far this month.

Pipe Demand Active

Demand for cast iron pipe continues active. This week's awards exceeded 2000 tons. United States Pipe & Foundry Co., through H. G. Purcell, Seattle, landed the largest contract, 1675 tons for the Ross Island Project, Portland, Oreg. This job also calls for a miscellaneous tonnage of couplings, flanges, special castings, steel pipe and 115 tons of shapes. French interests will furnish 576 tons, 8300 feet, of 16-inch cast iron mains for the Beacon hill improvement, Seattle, awarded through J. Argentieri, Seattle, general contractor. Pacific States Pipe Co., Provo, Utah, booked 122 tons for Chehalis, Wash. Portland has opened bids for 2500 tons of 6 to 30-inch cast iron pipe. Aberdeen and Montesano, Wash., will shortly call bids for furnishing water mains.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

California Opens Well

San Francisco—(*By Air Mail*)—Although awards were not heavy this week the undertone of the market is encouraging and some large projects are up for figures or will shortly come up for bids. Among these is the Hoover Dam project, bids on which will be opened in Denver March 4. Included in this project are 17,300 tons of reinforcing bars, 3218 tons of plates, 352 tons of sheet steel piling, 210 tons of rails and 11,700 tons of structural shapes.

Awards of concrete bars aggregated 1226 tons for the first week of the year, compared with 175 tons for the corresponding week a year ago. Unnamed interests booked 159 tons for paving work in Santa Barbara County, Calif., 250 tons for an apartment on Franklin street, Los Angeles, and 150 tons for the Jefferson school, Santa Barbara, Calif. The Concrete Engineering Co. secured 250 tons for a warehouse in Glendale, Calif. New inquiries include 283 tons for four bridges in Lane County, Oreg. Demand for merchant bar steel is restricted to small lots. Prices on this class of material appear firm at 2.25c, c.i.f. Out-of-stock quotations on reinforcing bars in the San Francisco and Los Angeles district remain unchanged at 2.50c, base, on carload lots.

Plate bookings were confined to lots of less than 100 tons. No action has been taken on 640 tons of 51-inch welded steel pipe for Los Angeles. Prices range from 2.05c to 2.25c, c.i.f.

Demand for structural steel is improving although awards brought only one project over 100 tons. The Judson-Pacific Co. took 225 tons for a subway for the Southern Pacific Co. in San Jose, Calif. Bids will be opened Jan. 16 for 600 tons for two bridges for the Western Pacific. An award will be made shortly on 7500 tons for the Olympic club, San Francisco. Plain material remains unchanged at 2.15c to 2.25c, c.i.f.

Other Finished Material

Cast iron pipe awards aggregated 1743 tons, compared with 3112 tons for the first week in 1930. The National Cast Iron Pipe Co. booked 143 tons for Inglewood, Calif. Bids have been opened on 1217 tons for Oakland and on 100 tons for Newport Beach, Calif.

Obituaries

(*Concluded from Page* 22)

with Stacey Bros. Gas Construction Co., Cincinnati, but who formerly was president and general manager of Stacey Mfg. Co. Cincinnati, died Jan. 6. His father was generally credited with constructing the first gas storage tanks in the United States.

□ □ □

Leslie G. Berry, president, Southern Engineering Co., Charlotte, N. C., died Jan. 3.

□ □ □

Milton Pray, head of the Milton Pray Co., San Francisco, died there last month. For many years he was connected with Miller, Sloss & Scott, and Pacific Hardware & Steel Co. but resigned in 1914 to open offices as a manufacturer's agent. The Milton Pray Co. is Pacific Coast representative for Apollo Steel Co., W. Ames Co., La Salle Steel Co., and Superior Steel Corp.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk	Gal.
⅛	58	44½	⅛	23	5
¾	62	50½	¾	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

⅛	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, Lap Welded Steel		f.o.b. Pittsburgh Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill

Random lengths over 5 ft. 55%
Selected lengths, 1 to 18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.....$37.00 to 38.00
Four-inch, Birmingham..... 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago..... 45.20 to 46.20
Six-inch and over, N. Y..... 38.50 to 40.50
Four-inch, New York ..... 41.50 to 42.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga..	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia..	2.60c
Pittsburgh	2.75c
Portland	3.15c
San Frans. ..	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga..	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York‡(d)	3.10c
Philadelphia..	2.60c
St. Louis	3.15c
Tulsa	3.65c

REINFORC. BARS

Baltimore....2.50c-	3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga..	3.10c
Cincinnati	3.15c
Cleveland ..2.25c-	2.44c
Detroit	3.00c
Houston	3.00c
Los Ang. cl....	2.40c
Los Ang. lcl..	2.70c
New York..2.65c-	3.10c
Phila. 2.40c-	3.00c
Pittsburgh	2.75c
San Fran. cl.	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young. 2.30c-	2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia..	2.50c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga..	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles..	3.40c
New York(d)	3.30c
Philadelphia..	2.50c
Phila. floor....	5.10c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	2.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in.	9.915c
Buffalo	3.50c
Chattanooga..	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
N. Y. (d)....3.20c-	3.40c
Portland	4.00c
Phila.*†	3.05c
Pitts.**	2.75c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt.*†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Clev.***	3.75c
Detroit	3.75c
Los Ang.	4.70c
New York..3.55c-	3.65c
Phila.*†	3.60c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.35c
Seattle	4.50c
St. Louis	4.05c
St. Paul	3.545c
Tulsa	4.10c

NO. 24 GAL. SHEETS

Balt.*†	4.25c
Boston	5.45c
Buffalo 4.40c-	4.60c
Chicago (local del.)	4.35c
Chicago (outside)	4.35c-4.60c
Cincinnati	4.90c
Cleveland***..	4.35c
Detroit	4.25c
Houston	5.40c
Los Ang.	5.10c
New York....3.35c-	4.10c
Phila.*†	4.15c
Pitts.**	4.00c
Portland	5.00c
San Fran.	5.00c
Seattle	5.00c
St. Louis	4.60c
St. Paul	4.23c
Tulsa 4.60c-	4.75c

BANDS

Baltimore	3.50c
Boston 4.015c-	5.00c
Buffalo	3.50c
Chattanooga..	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter....	3.30c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia..	2.90c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston 5.50c-	6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter ..	3.80c
New York	3.75c
Philadelphia..	3.15c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.70c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)....	4.75c
St. Paul (a)..	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 5½c extra, except Tulsa, where 5.14c is quoted.

(a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)..	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
Phila. (c).....	4.85c
New York	5.05c

(b) Net base straightening, cutting, boxing 1 ton or more.

(c) Plus mill, size and quantity extras.

(d) Minus quant. diff.

‡Domestic bars.

*Plus quantity extras.

**Less than 25 sheets.

*†50 or more bundles.

***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

SAVE WITH STEEL

Pig Iron
Open Hearth Steel
Billets—Slabs—Sheet Bar—Skelp
Angles—Beams and Channels
Round—Square and Flat Bars
Rails—Steel Plates—Tie Plates
Coke Tin Plate
Tin Mill Black Plate
Copper Bearing Terne Plate
Hot and Cold Rolled Strip Steel
and
Strip Steel Sheets
Long Terne Sheets
Galvanized, Black and Blue
Annealed Sheets
Single Pickled, Full Finished
and Auto Body Sheets

WEIRTON

Users of steel prefer Weirton finished and semi-finished products to the extent of buying a million and a quarter tons annually — because Weirton adheres most rigidly to the recognized standards of steel users throughout the entire nation.

In specifying Weirton products you will always receive products that are preeminently suited for your requirements.

Weirton products are under ownership control from the ore mines to finished marketable product.

WEIRTON STEEL CO.

Division of National Steel Corporation

WEIRTON W. VA.

SALES OFFICES IN ALL PRINCIPAL CITIES

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 10.00c, Conn., for copper

Sheets	
Yellow brass (high)	17.12½
Copper, hot rolled	19.75
Lead, full sheets (cut ½c more)	8.75
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	22.00
Seamless copper	22.12½
Rods	
Yellow brass (high, full turnings)	15.37½
Naval brass	16.37½
Anodes	
Copper, untrimmed	17.25
Wire	
Yellow brass (high)	17.62½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	7.25 to 7.50
Chicago	6.25 to 6.50
Cleveland	7.00 to 7.50
St. Louis	7.25 to 7.50
Heavy Yellow Brass	
New York	4.75 to 5.00
Heavy Copper and Wire	
New York	7.75 to 8.00
Boston	7.25 to 7.50
Chicago	7.25 to 7.75
Cleveland	6.50 to 7.00
St. Louis	7.00 to 7.50
Red Brass Borings	
New York	6.75 to 7.00
Yellow Brass Tubing	
Cleveland	4.25 to 4.50
Light Copper	
New York	6.75 to 7.00
Chicago	6.00 to 6.50
Cleveland	6.00 to 6.50
St. Louis	6.75
Light Brass	
Boston	3.50 to 3.75
Chicago	4.25 to 4.50
Cleveland	3.25 to 3.50
St. Louis	4.00 to 4.25
Zinc	
New York	2.00 to 2.25
Cleveland	1.25 to 1.50
St. Louis	2.00
Aluminum	
Clippings, soft, Cleveland	12.00 to 12.50
Clippings, hard, Cleveland	8.50 to 9.50
Borings, Cleveland	4.50 to 5.00
Mixed cast, Cleveland	5.00 to 6.00
Mixed cast, Boston	5.00 to 5.50
Mixed cast, St. Louis	4.25

Secondary Metals

Remelt aluminum No. 12	12.50
Brass ingots, 85-5-5-5	10.00

Quicksilver is $106

New York—Quicksilver is quiet at $106 a flask.

Metals

Consumers Show Reluctance to Enter Market and Prices Decline—Confusion Develops

New York—Confusion and weak prices have replaced confidence in the nonferrous metal market. Copper, zinc, lead, and silver have fallen to extremely low levels. Aluminum has held unchanged. Tin has lost most of its recent gain.

Absence of buyers has been the cause of lower prices. Production of metal has been cut substantially in recent months and appears to be down to the level of consumption except in tin. With large stocks in the hands of producers of all the metals, however, curtailment evidently is not a sufficient bridge for the quiet spells. The development of healthy markets evidently will be delayed until improvement is seen in business conditions.

Copper—The swiftness of the break from the apparently stable level of 10.50c to 10.00c, Connecticut, was a surprise to the trade. Domestic business has been extremely light but moderate export business has been going to custom smelters. A little speculative interest has been shown at the lower price. Refined copper stocks in North and South America were cut last month for the first time since October, 1929. The December average daily rate of production was 3431 tons, a cut of 324 tons from the November rate to the lowest since August, 1924. Daily average shipments last month were 3517 tons, down 74 tons. Refined stocks dropped 2657 tons and blister stocks 4481 tons.

Zinc—Most prime western zinc producers have been willing to accept business if they could get it at current low prices, but the market has not been pushed very hard. Producers do not want to go below 4.00c if they can avoid it, and this rather than the volume of buying has prevented the market from making much change during the past week. The ore market is stronger at $26 a ton.

Tin—Tin prices advanced rapidly about a week ago on favorable reports that the governments of the principal tin producing countries were getting together on an export quota plan, by which open market supplies would be limited for two years. Buying has been light during the past week.

Lead—The price cut from the recent stable level of 5.10c, New York, to 4.75c, was more than had been expected, though some decline was not surprising in view of dullness.

Aluminum—New business remains dull. Prices of new metal are steady but secondary metal is low and scrap weak.—*Daily Metal Trade.*

Coke By-Products Moving Moderately on Contracts

New York—Naphthalene shipments have started in fair volume on contracts for first quarter. Some spot business also is noted. Contracts compare favorably with 1930 in volume, but prices are lower than a year ago. Sulphate of ammonia is moving in moderate shipments to the fertilizer trade. Export demand is slow. Present contract prices will hold until April. Phenol buying is satisfactory with most distributors, shipments being in small lots for spot demands. The dyestuff trade is taking little phenol. Distillates are unchanged in price. Demand is routine. Coking operations still are low. The improvement in the automobile industry has not yet been reflected in this market to any extent.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Delivered	
Sulphate of ammonia	$1.95 to $2.00

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot	Nickel Ingot
Jan. 7	10.25	10.37½	10.12½	27.25	27.65	4.85	4.65	4.05	22.90	7.30	35.00
Jan. 8	10.12½	10.37½	10.00	26.90	27.30	4.75	4.55	4.02½	22.90	7.37½	35.00
Jan. 9	10.00	10.12½	9.87½	26.37½	26.75	4.75	4.55	4.02½	22.90	7.37½	35.00
Jan. 10	10.00	10.12½	9.87½	26.00	26.37½	4.75	4.55	4.02½	22.90	7.37½	35.00
Jan. 12	10.00	10.12½	9.87½	25.75	26.12½	4.75	4.55	4.02½	22.90	7.50	35.00
Jan. 13	10.00	10.12½	9.87½	25.87½	26.25	4.75	4.55	4.02½	22.90	7.70	35.00

Europe

Middlesbrough Pig Iron Down $1.21 a Ton—Steel Business Dull—Belgian Prices Easier

London — (*By Radio*) — Steel markets here and on the Continent continue dull. Pig iron prices at Middlesbrough have been reduced 5 shillings ($1.21) a ton. No. 3 foundry iron, containing 2.50 to 3 per cent silicon, now is $14.21, and basic is $14.58, furnace, for domestic or export shipment. The Central Pig Iron association will revise its prices by the end of the month. Inquiry for Barrow hematite has improved.

British railmakers hope to resume operations soon on domestic and South American orders. Galvanized sheet interests are worried by an increase in the Indian tariff. Dorman, Long & Co. have been awarded a 6500-ton structural steel contract for the Shellmex Oil Co., building in London. Braithwaite & Co., London, have booked contract for a large water tank in India.

Business in France, Belgium and Germany is seasonally calm. Easier prices are reported in Belgium.

British steel ingot and castings production dropped to 337,200 tons in December, from 433,700 tons in November. Output in December, 1929, was 661,200 tons. December pig iron production totaled 349,800 tons, compared with 384,100 tons in November, and 643,000 tons in December, 1929. Seventy-six stacks were operating at the close of December, a net loss of 16 in the month.

Better Signs Appear in British Steel Market

Birmingham, Eng.—A dull market has been heartened by the news of several large structural projects placed with Dorman Long of Middlesbrough. Early in January delivery will start on 10,000 tons of steel for a hotel in London, to be completed by 1933. Owing to the area of the site, 56,000 square feet, nearly 3000 tons of steel will be used before the building reaches ground level. Dorman Long will also build a new bridge across the river Foyle at Londonderry, Ireland, to cost £255,510, the work to be completed in 30 months.

Manufacturers of steel in Middlesbrough are short of orders and the week has been quiet. Prices have been maintained and the Steel association gives no hint of any concessions despite the slump. Home business is scarce owing to dearth of shipbuilding work and structural engineering. Though Dorman Long have booked some useful work recently this will not go far in providing rolling programs.

A hematite furnace has been put out of action for relining at the works of Pease & Partners at Normanby on the Northeast coast, but it is announced that this will be rekindled as soon as can be arranged. Of the 92 furnaces in the district only 24 are in operation.

The estimated making of pig iron on the northeast coast in 1930 was 1,875,000 tons, compared with actual production of 2,347,000 in 1929 and an annual prewar production of 3,500,000 tons.

Pig iron producers in Middlesbrough have had to take a little below the standard price for No. 3 in order to get business with Scotland. They also feel competition from the Midlands. To the big buyer the new

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, January 12	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$14.22	2 18 6*	$12.64	2 12 0	$12.64	2 12 0	$12.15	2 10 0
Basic-bessemer	14.58	3 0 0†	11.66	2 8 0	11.66	2 8 0	13.37	2 15 0
Hematite, Phosphorus 0.02-0.05	17.01	3 10 0	.....	.....	.....	.....	17.01	3 10 0
SEMIFINISHED STEEL								
Billets	$27.34	5 12 6	$17.74	3 13 0	$17.74	3 13 0	$17.50	3 12 0
Wire rods	41.31	8 10 0	29.16	6 0 0	29.16	6 0 0	29.16	6 0 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars	1.68c	7 15 0	.92c	4 4 0	.92c	4 4 0	.96c	4 7 0
Structural shapes	1.68c	7 15 0	.81c	3 13 0	.81c	3 13 0	.85c	3 17 0
Plates, ship, bridge and tank	1.79c	8 5 0	1.06c	4 16 0	1.06c	4 16 0	1.07c	4 17 0
Sheets, black, 24 gage	1.90c	8 15 0	1.80c	8 3 9	1.80c	8 3 9	1.93c	8 15 0
Sheets, galvanized, 24 gage, corrugated	2.44c	11 5 0	2.35c	10 13 9	2.35c	10 13 9	2.31c	10 10 0
Bands and strips	2.06c	9 10 0	1.02c	4 12 6	1.02c	4 12 6	1.01c	4 12 0
Plain wire, base	2.06c	9 10 0	1.21c	5 10 0	1.21c	5 10 0	1.23c	5 12 0
Galvanized wire, base	3.04c	14 0 0	1.49c	6 15 0	1.49c	6 15 0	1.54c	7 0 0
Wire nails, base	2.39c	11 0 0	1.21c	5 10 0	1.21c	5 10 0	1.23c	5 12 0
Tin plate, base box 108 pounds	$ 3.83c	0 15 9	.....	.....	.....	.....	$ 8.26	1 14 0
Domestic Prices at Works or Furnace—Last Reported				Francs		Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$15.43	3 3 6	$11.59	295(2)	$12.19	510	$19.75	83
Basic pig iron	15.80	3 5 0	13.56	345(1)	10.76	450	21.05	88.50
Furnace coke	2.92	0 12 0	6.60	168	4.30	180	5.09	21.40
Billets	27.34	5 12 6	19.26	490	15.89	665	27.95	117.50
Standard rails	1.79c	8 5 0	1.41c	785	1.34c	1,220	1.46c	136
Merchant bars	1.68c	7 15 0	.97c	540	.86c	785	1.47c	137
Shapes	1.84c	8 10 0	1.12c	620	.81c	740	1.43c	134
Plates, ship, bridge and tank	1.95c	9 0 0†	1.37c	760	.96c	875	1.64c	153
Sheets, black, 24 gage	1.90c	8 15 0	2.29c	1,270	2.03c	1,850	1.34c	126
Sheets, galvanized 24 gage, corrugated	2.44c	11 5 0	3.06c	1,700	2.31c	2,100	3.64c	340
Plain wire	2.06c	9 10 0	2.16c	1,200	1.82c	1,650	2.32c	217
Bands and Strips	2.06c	9 10 0	1.22c	680	1.21c	1,100	1.70c	159

•Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.92) f. o. b. Ferromanganese £19 6s 0d ($93.80) delivered Atlantic seaboard, duty-paid. German ferromanganese £12 5s 0d ($59.54) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.

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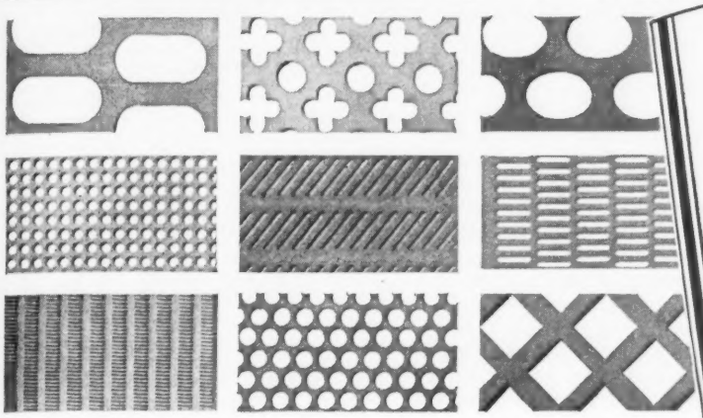

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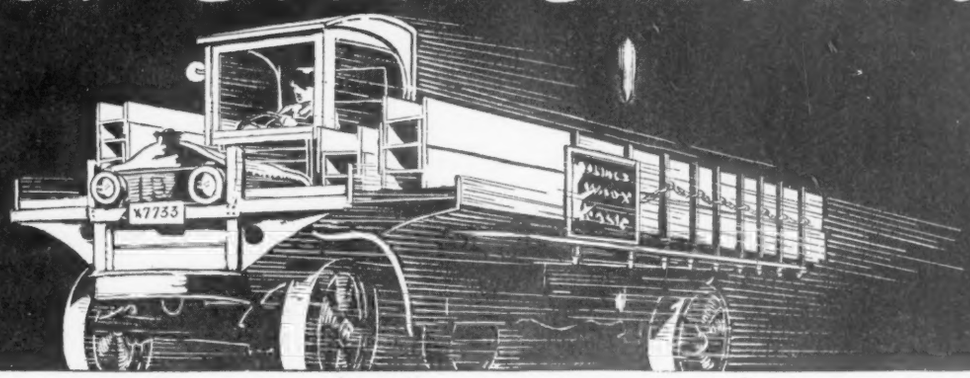

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rebate scheme introduced by Midland producers of pig iron will doubtless prove an attraction but it is too soon yet to judge of its effect.

The arrangement which nearly all the furnacemen have made is that consumers must be prepared to give an undertaking to abide by the terms and claims for rebate will have to be accompanied by a declaration that during the period covered they have not purchased, either directly or indirectly, as principals or agents, any imported iron. The arrangement is common to all the zones defined by the Central Pig Iron Producers' association, with the exception of South Wales, which was decontrolled some time ago in order that producers might have a free hand to fight foreign competition there.

The outlook for railroad materials and vehicle makers is gloomy and at the Midland works producing passenger and freight cars capacity is idle to a greater extent than for years. British companies are short of money, and with more rolling stock on the rails than they can possibly use at present they are placing no new orders. The Colonies continue to send in a few small jobs but keen competition is going on between British, American and European producers.

Sheet Plant To Resume

A sheet works at Llanelly has been scheduled for reopening at the year end. A modern works, it has been built only two years but was obliged to close down in March owing to scarcity of orders. It is hoped to have mills and furnaces going early in the new year.

A better feeling exists in the Welsh tin plate industry following the receipt of more inquiries from Australia, Canada and Holland. The withdrawal of control of prices has brought more business, though at lower prices, and prospects are brighter than for a long period. Prices are not likely to fall much further and makers are hoping for early stabilization.

Conditions are not so hopeful in galvanized sheets as stagnant conditions prevail at most of the works. Home business has kept mills running in some instances but works which depend mostly on overseas business have long since suspended operations.

In the northwest district around Barrow in Furness only six furnaces are in blast. Stocks are heavy but are being slowly reduced by improvement in demand. Larger supplies are wanted for early delivery. The rail mills at Barrow are idle, but small steel sections are still being produced at the hoop mills.

Deliveries of Continental material are taking place to the Midland district though on a reduced scale. Merchants are quieter than they have been for months past and this week there has been nothing to indicate any early improvement.

French Price Disparity May Lower Wages

Paris—Of most interest in the general position of the French iron and steel market is a stabilization of prices around the average level quoted lately. The effects of the world crisis are not being felt severely in France. However, the effect is chiefly moral, because the French people, being persuaded that their country was independent of what was happening elsewhere, have been surprised to see business slowing down.

Furthermore, there is one thing which puzzles everyone, the important difference between the retail and the wholesale prices, and this causes general dissatisfaction. Whereas the former prices have somewhat increased, the latter are heavily falling. It would seem that the intervention of the government could restore equilibrium, for there is no doubt the high level of retail prices is caused by the important profits made by the too numerous intermediaries between producer and consumer.

It also is evident that the chief consumer, according to number, is constituted by workmen, and up to now, their wages remaining what they were, they continue to buy in the same proportion as previously. It would seem that a readjustment of wages is necessary, but to bring this about, the crisis would have to extend and more seriously affect the general economic situation.

In spite of the great amount of foreign labor, there is no unemployment in France; it will only be when unemployment appears that wages of French workmen will be brought to the level prevailing elsewhere.

Germany at New Low

Berlin—Lowest figures for the year are presented in Germany's production of pig iron, steel ingots and castings and finished steel for November. Comparisons in metric tons are as follows:

Mon. ave.	Pig iron	Steel ingots and castings	Finished steel
1913*	909,640	993,640	970,240
1927	1,091,875	1,359,225	1,069,930
1928	984,700	1,209,770	880,690
1929	1,116,730	1,353,820	940,425
1930			
Jan.	1,092,206	1,275,023	896,076
Feb.	964,517	1,176,435	797,899
March	1,007,576	1,201,206	834,349
April	901,358	1,033,383	737,355
May	859,657	1,034,088	735,741
June	767,395	859,310	603,378
July	770,928	905,763	664,401
August	739,083	896,514	619,861
Sept.	652,863	814,117	576,948
Oct.	687,497	856,433	622,617
Nov.	636,564	738,740	522,702

*Present boundaries.

British Production Shrinks

London—British production of pig iron in November was the lowest in many years. Production of steel ingots and castings was also unusually small. Comparisons in gross tons are as follows:

(Gross tons)

Mon. ave.	Act. Fur. on last day	Pig iron	Steel ingots and castings
1913	338(*)	855,000	638,600
1927	149	607,700	758,100
1928	132	550,900	710,400
1929	162	631,600	804,560
1930			
Jan.	159	560,000	771,100
Feb.	162	607,000	776,400
March	157	665,800	826,100
April	151	619,600	696,100
May	141	614,500	692,800
June	133	563,200	600,100
July	105	486,100	621,400
Aug.	104	416,700	451,300
Sept.	104	425,000	580,600
Oct.	96	415,000	512,500
Nov.	92	384,100	433,700

(*) Average for year.

Luxemburg Output Drops

Brussels—Output of pig iron and steel ingots and castings in Luxemburg in November was below that of October and differed little from figures of the preceding five months, as is shown in the following figures, in metric tons:

Mon. ave.	Furnaces on last day	Pig iron	Steel ingots and castings
1913	....	212,320	111,355
1927	39	227,710	200,595
1928	38	230,840	214,315
1929	37	242,175	225,605
1930			
Jan.	37	249,875	216,315
Feb.	36	231,326	214,857
March	35	248,983	225,285
April	32	221,209	198,250
May	....	212,168	189,027
June	27	178,203	150,267
July	27	185,043	164,889
August	....	197,242	177,270
Sept.	26	190,225	186,448
Oct.	26	197,177	195,472
Nov.	26	178,604	168,879

British Trade Declines

London—Imports and exports in British trade in November were at the lowest mark for the year in all divisions, as shown in the following figures, in gross tons;

	— Imports —		— Exports —	
Mon. ave.	Pig iron and ferro-alloys	Other iron and steel	Pig iron and ferro-alloys	Other iron and steel
1927	50,715	316,455	27,580	322,100
1928	9,935	231,390	37,895	317,210
1929	12,310	222,410	45,430	319,520
1930				
Jan.	15,770	294,546	40,445	311,401
Feb.	24,252	235,144	26,865	267,422
Mar.	23,186	257,106	39,461	298,253
April	21,254	213,552	30,100	227,895
May	23,039	210,686	32,586	262,143
June	25,031	189,473	21,588	229,381
July	25,674	173,114	25,086	278,358
Aug.	21,931	173,473	22,026	218,828
Sept.	30,484	193,345	13,459	186,821
Oct.	31,395	233,085	26,177	238,193
Nov.	26,410	183,359	20,074	183,845

Machinery

GAINS reported last week in the metalworking industry are being held, and one favorable sign is that employment is beginning to supersede unemployment as a general topic of conversation. No industrial center has produced any sizable equipment orders, but almost without exception they produce evidence of the kind of activity which eventually will lead to orders. In this, machine tool men see the beginning of the gradual recovery which they expect throughout 1931. Sales plans are being overhauled on the basis of new engineering developments, market research and also along the line of deferred payment, based on improved production.

New York—Inquiry shows pronounced improvement and orders for machine tool equipment are heavier. While there is no decided spurt, builders and dealers are more optimistic and look for gradual improvement from now on. There are few formal or budget lists out, inquiry and orders being confined to one or two units at a time. This is not always old business again come to life, but in many cases represents fresh inquiry. One large dealer reports that he already has attained as much volume in January as during all of December. Improvement in general manufacturing is being reflected, and with inventories low and any increase in demand is quickly noted.

The navy department took bids on more than 25 tools last week, there being a long list of bidders for this business. Merger plans involving eastern railroads are not immediately expected to stimulate equipment buying, as the railroads involved are inclined to wait the clearing up of the situation. Ball bearing plants in southern New England are operating four and five days a week, Chevrolet keeping one plant moderately occupied. The gain in machine tool inquiry has spread to practically all branches, including grinding machinery. There has been considerable engineering and repair work during the last few weeks. Russia continues to take a good volume, two ships having sailed within the last 10 days with cargoes of implements and tools. Indications now are that Russian buying in 1931 will be heavier than in 1930.

Pittsburgh—Machine tools show a definite improvement in activity over conditions of a month ago, both in awards and inquiry. Sales still are seasonally light but in view of the volume of pending and prospective work, sellers are more optimistic regarding business during coming months. A fair volume of work has been pending for as long as six months and although some of these programs have been abandoned, a few are being revived. Westinghouse Electric & Mfg. Co., is inquiring for a few tools but inquiry from railroads still is very light. Steel companies are fairly active in inquiry, a large portion of which involves special equipment.

Worcester, Mass.—Business is sluggish in all lines, but the revival of automobile manufacturing activity holds forth hope to machine tool builders that equipment buying will be resumed soon. What few orders there are for grinders, drilling machines, lathes, etc., are small and scattered. With the textile industry continuing in a depressed condition, machinery sales in that direction fail to show signs of recovery.

Cleveland—Conditions remain essentially as they were last week, the gain in manufacturing activity being held, but no further gains of consequence being reported. According to several machine tool builders and dealers, the present level of inquiry and orders, if maintained throughout the month, will make January slightly better than December, which in turn was, in several cases, just a little better than November. This condition is pointed out by machine tool men as a foretaste of what they look forward to throughout 1931—gradual but unimpressive recovery.

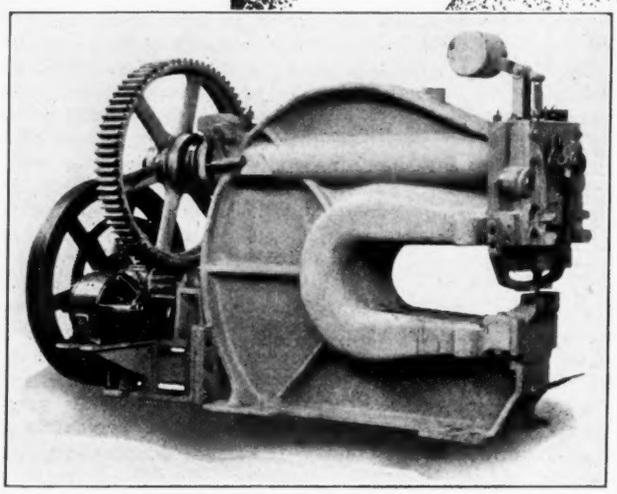
While active engineering developments have been going on, a lot of thought at the same time has been given to these developments from the sales point of view. Equipment salesmen are being given intensive instruction in the advantages of new features, and the market already is beginning to feel the effect of the pressure of new ideas. Announcement by an eastern machine tool builder of a plan to pay for new equipment out of earnings made possible by the equipment is arousing considerable interest.

Chicago—Scattered machine tool orders are noted and Western railroads give indication of some activity. Santa Fe is inquiring for a 24 x 4-inch wheel grinder and is expected to have a list of four or five other tools shortly. A steelworks buyer is in the market for two rotary type scrap shears. Sales of light production tools lead in buying, but orders are meager. Dealers report a number of orders ready for delivery without definite shipping instructions. According to reports, another machine tool builder may come out soon with a new model gear-head lathe. No definite word has been received as to the large Lane Technical high school inquiry. A number of production and shop tools of LaSalle Machine Works, Inc., and Columbia Engineering & Steel Treating Co., of Chicago, were sold at auction last week.

Exports of Metalworking Machinery

	November		January through November	
	1930	1929	1930	1929
Engine lathes	38	37	1,025	800
Turret lathes	12	45	396	468
Other lathes	59	63	632	898
Vertical boring mills and chucking machines	9	14	292	202
Thread-cutting and automatic screw machines	46	85	638	947
Knee and column type milling machines	19	67	308	486
Other milling machines	41	59	661	623
Gear-cutting machines	46	19	389	416
Vertical drilling machines	19	18	454	371
Radial drilling machines	7	24	153	121
Other drilling machines	80	42	1,483	1,947
Planers and shapers	20	32	309	456
Surface grinding machines	2	33	166	253
External cylindrical grinding machines	24	70	490	757
Internal grinding machines	5	22	293	425
Tool grinding, cutter grinding, and universal grinding machines	65	93	1,507	1,287
Pneumatic portable tools	1,276	1,725	17,404	23,170
Chucks for machine tools	984	1,095	20,608	18,879

CLEVELAND
FABRICATING TOOLS



Cleveland Vertical Open Gap Machines can be furnished in 14 sizes with capacities ranging from ½″ hole through ½″ material to 6″ hole through 1½″ material and with throat depths from 6″ to 72″. Standard punching and shearing attachments are interchangeable.

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THE CLEVELAND PUNCH & SHEAR WORKS CO.
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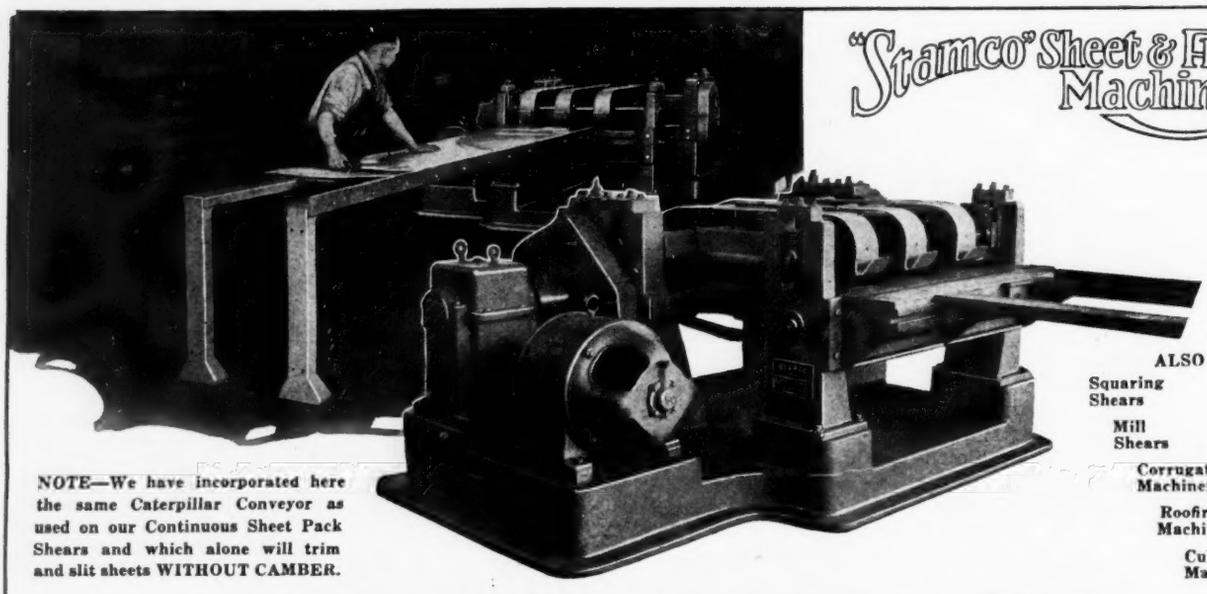

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ALSO
Squaring Shears
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Caterpillar Holddown Conveyor Rotary Slitter
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CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

BRIDGEPORT, CONN.—New Era Construction Corp., care of R. D. Zappone, 511 Fifth avenue, New York, will construct a warehouse and plant here at Noble avenue and Harriett street. Cost is estimated at $100,000.

TURNERS FALLS, MASS.—Turners Falls Power & Electric Co. plans to erect a power plant addition. Cost, with transmission line, is estimated at $500,000.

WEST NEWTON, MASS.—Ruddick Co. is in the market for an alternating current electric drill.

YARMOUTH, MASS.—City council is having plans prepared for waterworks extensions, to include a pumping station. Estimated cost, $75,000.

PORTSMOUTH, N. H.—Bureau of supplies and accounts, navy department, Washington, will receive bids Jan. 20 on schedule 4863 for one motor with reducing gears, for delivery to the navy yard here. Bids will be received Jan. 27 on schedule 4913 for two automatic screw machines with attachments.

New York

BROOKLYN—S. R. Smith has been incorporated with $10,000 capital by J. W. Mass, 246 Lorimer street, to deal in motors.

BUFFALO—Electro-Alloys Inc. has been incorporated with $50,000 and 600 common shares by C. D. Cummings, Dun building.

LOCKPORT—Lockport Lead Co. has been incorporated with $75,000 capital by Charles A. Johnson, 95 Niagara street.

NEW YORK—Delevan White Metal Corp. has been incorporated with $20,000 capital by A. H. Goodman, 1482 Broadway.

NEW YORK—Manis Valve Lock Co. has been incorporated with $20,000 capital by J. H. Mariano, 110 East Forty-second street.

NEW YORK—Builders Sheet Metal Works has been incorporated with $5000 capital by A. G. Christmas, 160 Broadway.

NEW YORK — Manhattan Electric Motor & Tool Co. has been incorporated with $20,000 capital by H. B. Rosenbaum, 225 Broadway.

NEW YORK—Lindquist Metal Weather Strip Co. has been incorporated with $10,000 capital by J. Danziger, 276 Fifth avenue.

NEW YORK — Reliance Specialties Mfg. Co. has been incorporated with $6250 and 500 common shares by M. D. Kopple, 66 West Fortieth street, to deal in metal products.

NEW YORK—L. D. Katz Wire Works has been incorporated with $5000 capital by Weinchelblatt & Rosenthal, 1123 Flushing avenue, Brooklyn, N. Y., to make skylight screens.

New Jersey

ELIZABETH—Columbia Iron & Steel Construction Co. has been incorporated with $125,000 capital by Clarick & Clarick, 80 Broad street.

Pennsylvania

ALLENTOWN—Allentown Auto Spring Co. has been incorporated with $5000 capital by William W. Brodie, 142 Clifton place, Brooklyn, N. Y., to manufacture motor vehicle parts and accessories.

BEAVER FALLS—Park Engineering Co. has been incorporated with $5000 capital by Ralph E. Chamber, Dravo avenue and Fifth street, to manufacture and deal in airplanes, airplane equipment and other devices.

BUTLER—Butler Iron & Steel Co. has been incorporated with 1000 no par shares by Charles Horewitz, North Main street, to deal in and prepare for market iron, steel and other metals.

JOHNSTOWN—Leitenberger Machine Co. Inc. has been incorporated with $25,000 capital by Carl W. Leitenberger, 538 Cypress avenue, to manufacture and deal in machinery, tools, appliances, equipment and parts.

LANCASTER—Welchans Elevator Works Inc. has been incorporated with $100,000 capital by Edward F. Evans, 137 North Pine street, to make and deal in elevators.

PHILADELPHIA — Globe Machinery & Supply Co., Des Moines, Iowa, has secured 20,000 square feet of floor space at Seventh and Rockland streets for an assembly plant and warehouse.

PHILADELPHIA — Duquesne Steel Foundry Co. has been incorporated with $5000 capital by James H. Boyd, 1724 Oliver building, to manufacture and deal in steel and other metals.

PHILADELPHIA—Allegheny Body

New Structural Steel Plant at Los Angeles

Consolidated Steel Corp. Ltd., Los Angeles, is building a structural steel fabricating plant on a 50-acre site at Slauson and Eastern avenues and has an option on twenty-five acres adjoining. The company is the result of the merger of the former Llewellyn, Baker and Union works and construction of the new plant is to concentrate production of the three in fabricated steel, pontoon decks and bolted tanks. The above view shows how construction is proceeding. Materials from the present Union Iron plant will be salvaged and used in erection of the new plant

Co. Inc. has been incorporated with $10,000 capital by Jacob Sucknow, 4628 North Tenth street, to deal in and repair auto bodies.

PHILADELPHIA—Keystone Condenser Corp. has been incorporated with 3000 no par shares by John Stern, 4934 North Seventeenth street, to manufacture and deal in radio and electrical appliances and devices.

PITTSBURGH—Fernald Co. has been incorporated with $5000 capital by F. W. Fernald, 335 Fifth avenue, to manufacture and deal in hardware, mill and mine supplies, machinery and equipment.

PITTSBURGH — Steel Industries Engineering Corp. has been incorporated with $40,000 and 10,000 no par shares by Ralph F. Leckey, 721 Penn street, North Braddock, Pa., to manufacture, erect and deal in furnaces, machinery and auxiliary equipment for the production of metals.

READING—Walter H. Fritz & Co. Inc. has been incorporated with 100 common shares by Paul H. Fritz, 11 South Fourth avenue, West Reading, Pa., to manufacture and deal in plumbing devices.

ROYERSFORD—Dutton-Nelson Inc. has been incorporated with $50,000 by J. Arthur Nelson, 652 Main street, to manufacture and deal in heating, ventilating, air conditioning and refrigerating apparatus.

SHARPSBURG—Sharpsburg Foundry Co. has been incorporated with $100,000 capital by Joseph C. Kotoush, 464 North avenue, Millvale, Pa., to manufacture metal products, machinery and castings.

WARREN—C. Beckley Inc. has been incorporated with $40,000 capital by M. M. Beckley to manufacture and deal in electrical appliances.

WILKINSBURG—Calorizing Co. has started construction of a foundry unit, 80 x 140 feet. Austin Co., Union Trust building, Pittsburgh, is the builder.

YORK—Morehouse Machine Co. has been incorporated with $10,000 capital by C. Linden Gladfelter, Seven Valleys, Pa., to design, manufacture and sell instruments, apparatus, testing machines, parts and tools.

Ohio

CLEVELAND—Tyroler Metals Inc. has been incorporated with $25,000 capital by C. G. & F. N. Shaver, 1002 Ulmer building.

CONNEAUT—Industrial Supply & Mfg. Co. has secured the Craftsman Tool building here and will start operations with Frank Longstreet as local manager. About 60 employes will be required to start.

DAYTON—Acme Spring & Welding Inc. has been incorporated with 250 no par shares by Legler & Murray, 404 Callahan Bank building, to make springs.

DAYTON—United States Air Corp. structure at Wright field housing four planes and testing equipment of the engineering division recently was damaged by fire. Loss is estimated at $75,000 to $100,000.

SANDUSKY—Plant of the Mathews Engineering Co., including storage unit containing auto parts, recently was destroyed by fire. Loss is estimated at $100,000.

SHELBY—City council is having plans prepared for power plant extensions. Burns & McDonnell Engineering Co., 400 Interstate building, Kansas City, Mo., is engineer.

Indiana

LAFAYETTE—H. H. Horner has plans for a 1-story machine shop and garage, 130 x 165 feet, to be built on East Main street. F. P. Reidel is architect. Approximate cost, $50,000.

MISHAWAKA—S. & H. Foundry Co., recently organized by August C. Scherrer and Walter A. Hammer, is a new industry here, starting operations with 25 employes. Company will make aluminum, brass and bronze castings. Initial floor space is 5000 square feet.

SOUTH BEND—Ware Foundry Inc. has been incorporated with 1000 no par shares by John H. Ware, to operate a foundry and machine shop.

Michigan

ANN ARBOR—Plant of the Cavac Corp. recently was virtually destroyed by fire. Company manufactured chassis for radios.

ST. JOSEPH—City is having plans prepared for a filtration plant and pumping station. Gordon & Bulot, 53 West Jackson boulevard, Chicago, are engineers. Estimated cost, $175,000.

Illinois

CHICAGO—M. Silvey, 3326 Madison street, has a building permit for a shop addition, 25 x 50 feet, to cost about $6000.

CHICAGO—United States Coal Eliminator Corp., 29 South LaSalle street, has been incorporated with $10,000 capital by Isaac B. Lipson, 77 West Washington street, to deal in heating devices.

CHICAGO—Garfield Specialty Corp., 4009 North Bernard street, has been incorporated with $5000 capital by William R. Peacock, 140 North Dearborn street, to manufacture lamps.

CHICAGO — Incinerator Engineering Corp., 333 North Michigan avenue, has been incorporated with $24,000 capital by Orin W. Coler, 160 North LaSalle street, to manufacture and sell incinerators.

GALVA—Griffis Hays Foundries Inc. has been incorporated with $50,000 capital by H. E. Anthony, 42 East Losey street, Galesburg, Ill., to engage in a general foundry business.

QUINCY—Bayne Culvert Co. has leased a plant at Second and Jersey streets. George G. Bayne is manager. Production will start in March.

Southern States

WASHINGTON—Bureau of supplies and accounts, navy department, Washington, will receive bids Jan. 20 for delivery to either Hampton Roads, Va., or San Francisco, for one horizontal boring, drilling and milling machine. Bids will be received Jan. 27 for one 3-kilowatt motor generator set with spare parts, one buffer and polishing lathe. On Jan. 27 bids will be received for equipment to be delivered at various points for government ships. Included will be 9 coil winding machines, 8 combination grinders and buffers, and 8 motor-driven bench drills.

LEXINGTON, KY.—Saunier Brothers are enlarging their ornamental iron and structural steel works at 151 Saunier avenue.

NEW ORLEANS — Boiler equipment will be purchased by Charity hospital. Cost is estimated at $12,500.

NEW ORLEANS—Charles A. Anderson, care of New Orleans Association of Commerce, plans to establish an iron galvanizing plant here.

OAKDALE, LA.—City council proposes construction of a municipal light and power plant. F. P. Joseph, Glenmora, La., is consulting engineer.

SHREVEPORT, LA.—J. B. Beaird Corp. is erecting a plant addition, 140 x 300 feet, to house a steel foundry, machine and forge shop.

SHREVEPORT, LA. — George E. Lamb, Quartermasters corps, U. S. A., in charge of construction of an aviation field here for the Third Attack group, advises that plans for construction of machine shops will not be available for several months, though erection of hangars and other units will be started soon.

BALTIMORE—H. C. Weiskittel Co. has awarded contract to E. Eyring & Sons Co., Third street and Fait avenue, for construction of pattern and machine shops, pipe foundry, garage and plant for the manufacture of gas ranges. Structure will be erected at Philadelphia road and Monument street. Owner may be addressed through contractor.

HIGH POINT, N. C.—Automatic Electric Co. will manufacture a telephone device invented by T. A. and Robbins Tilden.

CHATTANOOGA, TENN. — Crane Co., 836 South Michigan avenue, Chicago, is reported to be considering locations here for establishment of a radiator plant.

HAMPTON ROADS, VA.—Bureau of supplies and accounts, navy department, Washington, will receive bids Jan. 20 for delivery to the navy yard here for one motor with control and chain drive and one motor-driven crank shaper.

MARION, VA.—W. F. Culbert & Sons, quarry operators, have awarded contract to the Coatesville Boiler Works, Coatesville, Pa., for the construction of a plant for the manufacture of paving materials. Four units are planned. Crushing, conveying and processing equip-

ment will be installed. Plant is to be completed in April.

Missouri

ST. LOUIS—Alco Valve Co. Inc., 2628 Big Bend boulevard, plans to increase facilities and purchase equipment.

ST. LOUIS—Thermos Electric Co. has leased a building at 4327 Duncan avenue. Company will manufacture electrical equipment and radio apparatus.

ST. LOUIS—F. X. Speh & Sons Monument Co., 6845 Gravois avenue, will build a shop and office at Gravois and Vermont avenues. Shop unit will be 24 x 80 feet. Contract is held by Henry Beetz, 2668 Nebraska avenue.

ST. LOUIS—National Tank & Equipment Co., J. W. McAfee president, has been organized for the manufacture of steel storage tanks, ranging from 120-gallon to 20,000-gallon capacity. Company will be associated with the Missouri Boiler & Sheet Iron Works, 908 South Twenty-third street. Latter company will furnish plant facilities.

Arkansas

LITTLE ROCK — Arkansas Body Co. is erecting a plant here to manufacture truck and bus bodies, including those of all-steel construction.

Oklahoma

OKLAHOMA CITY—Fremont Foundry & Valve Works, 1340 West Fifth street, advises through R. B. Fremont, president, that the company has been incorporated to expand the manufacture of oil field items. No building increase is planned at present. (Noted Jan. 8.)

TULSA—Union Transportation Co., J. A. Frates president, has made plans for a repair shop at Archer and Guthrie streets.

TULSA—Welders Supply Co., 317 East Third street, plans erection of a new building, 50 x 65 feet, to include a department for repair of welding equipment.

Kansas

ABILENE — West Texas Utilities Co., with headquarters here, will build substations on a line from Dickens, Tex., to Afton, Tex., a substation at the Abilene municipal airport, and substations near Brady, Tex. and McCamey, Tex.

EDINBURGH—Central Power & Light Co., First National Bank building, San Antonio, Tex., will build substations on a transmission line from Edinburgh to Falfurrias, Tex. Cost is estimated at $150,000.

FT. WORTH — Texas Power & Light Co. has awarded contracts for a new pump house and other improvements at the power plant here to Harry B. Friedman, Sinclair building.

FT. WORTH—Tarrant county commissioners have awarded contract to E. S. Newcome & Co., Dan Waggoner building, for construction of a county shop building, in two sections, 30 x 60 feet and 15 x 30 feet. Building will be utilized for repair of county road machinery and other equipment.

FT. WORTH—City council will build an 80 x 300-foot repair shop and hangar at Meacham field at a cost of about $30,000. William Bryce is mayor. Texas Aero Corp. will lease the unit, moving its Dallas., Tex., and Temple, Tex., shops here. Texas company eventually will manufacture planes here. Equipment estimated to cost $45,000 will be purchased. (Noted Oct 9.)

HOUSTON—A. Dewer, box 1598, is considering erection of a plant for the manufacture of spikes, bolts and rods from scrap steel.

HOUSTON—Southwestern Can Co., Greenwood and Esperson streets, is having plans prepared for construction of a plant. Joseph Finger, Democratic building, is architect.

LIBERTY—Texas & Louisiana Tool Co. is reported to have purchased a site for a plant for the manufacture of tools.

SAN ANTONIO—Maj. A. W. Robins, Duncan field, will be in charge of construction of a $500,000 machine shop unit here, construction work to start about Feb. 1. Structure will be 250 x 600 feet and will be used for repair and manufacture of parts. (Noted Oct. 9.)

Wisconsin

SHEBOYGAN — Milwaukee Electric Railway & Light Co., 217 Michigan avenue, has awarded contract for a 2-story, 40 x 180-foot warehouse.

SOUTH MILWAUKEE—I. J. D. Metal Products Co., manufacturer of sheet products, has let contract for the erection of a 2-story plant addition, 60 x 80 feet, to be built at Thirteenth and Minnesota avenues. Five new presses, the largest capable of handling automobile fenders, will be purchased.

Colorado

LA JUNTA—Atchison, Topeka & Santa Fe railway, M. J. Collins general purchasing agent, 80 East Jackson street, Chicago, will install additional equipment in its shops here.

PUEBLO—Colorado Fuel & Iron Co. has started construction of a unit at its Minnequa works for the manufacture of steel grader blades. New equipment is to be installed. Construction will be completed about Feb. 1.

Montana

BUTTE — National Parks Airways, Alfred Frank president, recently noted as planning construction of a hangar here, is constructing an addition which will house a repair shop. (Noted Nov. 6.)

Idaho

RATHDRUM—Charles F. Grimm has acquired the former Rathdrum Iron Works plant and has started operations.

Pacific Coast

COSTA MESA, CALIF.—Southern California Edison Co., Los Angeles, plans to build a substation here at a cost of about $100,000.

LOS ANGELES—Overland Terminal Warehouse Co., 1885 Industrial street, will build a warehouse on East Ninth street at an approximate cost of $650,000.

MARE ISLAND, CALIF.—Bureau of supplies and accounts, navy department, Washington, will receive bids Jan. 20, for delivery to the navy yard here, for one 20-inch universal table shaper, on schedule 4881. Bids will be received Jan. 27, for one ¼ to 1¾-inch drill grinder, on schedule 4908. Bids will be received on schedule 4863 on Jan. 20 for two motors with reducing gears.

OAKLAND, CALIF.—J. Van Selzer, 1226 Seventeenth avenue, proposes to erect a machine shop, 50 x 100 feet, at Seventeenth avenue and East Fourteenth street.

OAKLAND, CALIF. — Controlader Corp., 3734 Hopkins street, recently organized with $100,000 capital, will manufacture and distribute an all-metal device for closing doors. E. A. Hansen is president.

PITTSBURG, CALIF.—Redwood Manufacturers' Co., Hobart building, San Francisco, proposes to build a power plant here. Approximate cost, $50,000.

SAN BERNARDINO, CALIF.—San Bernardino county water district No. 9 proposes to provide waterworks extensions, including construction of pumping stations. Estimated cost, $50,000.

PORTLAND, OREG.—City council is considering establishment of a municipal power plant. City commissioner R. C. Clyde is interested in the project.

BELLINGHAM, WASH.—Carson & Schank, recently noted as planning a machine shop, advise through C. V. Carson that the contractor is A. P. Jensen. Unit will be 40 x 50 feet. Future equipment includes shaper, milling machine, large and small lathe, horizontal boring machine, radial drill, keyseater and traveling crane. (Noted Dec. 25.)

BREMERTON, WASH.—Bureau of supplies and accounts, navy department,

Washington, will receive bids Jan. 20 for a turret lathe, to be delivered here.

SEATTLE—Universal Steam Generator Corp. has been incorporated with $10,000 capital by W. F. Reque to manufacture steam control devices.

SEATTLE—Pacific Iron & Metal Co. has awarded contract for a warehouse to be erected at Fourth avenue south and Stacy street. Overhead cranes, shears, magnets and other equipment will be installed. Cost is estimated at $100,000.

Dominion of Canada

EDMONTON, ALTA.—Standard Iron Works, 106th avenue and 121st street, will rebuild its plant, recently noted as damaged by fire, and will purchase new equipment. R. M. Dingwall, 10051 118th street, is manager. (Noted Dec. 25.)

EDMONTON, ALTA.—City council has approved expenditure of $450,000 for boiler and other equipment as a part of a power development recently noted. Included will be a boiler with appurtenances, costing $175,000, and handling equipment costing $50,000. J. M. Douglas is mayor. (Noted Dec. 25.)

KALSO, B. C.—City council has provided for the rebuilding and enlargement of the municipal light and power plant. Plans will be prepared by A. L. McCulloch. Estimated cost, $30,000. Bids will be received for equipment by W. V. Papworth, city clerk.

VANCOUVER, B. C.—General Motors Products of Canada Ltd. will occupy a $50,000 warehouse and office unit for which Dominion Construction Co. Ltd., 509 Richards street, has the contract.

WINNIPEG, MAN.—Winnipeg Bridge Co. Ltd., Lombard building, advises through N. A. Cain, managing director, that units recently noted are being built by the company's forces. Warehouse is 80 x 115 feet and shop is 45 x 150 feet. Equipment to be installed includes cranes, structural steel shop machinery and tools. (Noted Jan. 8.)

KITCHENER, ONT.—Aeronca Aircraft of Canada advises through Bretislav Pliske, 701 Star building, Toronto, Ont., that the company, associated with Aeronautical Corp. of America, will arrange for the manufacture of Aeronca aircraft in Kitchener or other city in western Ontario. Present plans, indefinite, will be superseded by detailed plans soon. (Noted Jan. 8.)

LAKEFIELD, ONT.—City will improve the municipal waterworks system and purchase pumps. Approximate cost, $50,000.

NEW TORONTO, ONT.—Anaconda American Brass Ltd., Eighth street, as a part of an improvement program recently noted, has awarded contracts for a 1-story tube mill addition. (Noted Aug. 14.)

OSHAWA, ONT.—Vitreous Corp. Ltd. has been incorporated with $150,000 and 25,000 no par shares by Helen A. Bowman to manufacture and deal in hardware, metal stampings and enameled products.

ST. CATHERINES, ONT.—Lincoln Foundry & Machine Works Ltd. has been incorporated with $40,000 capital by William D. Kier and James G. Schiller, to manufacture hydraulic and dipper dredges and dredge equipment.

TORONTO, ONT. — Runnymede Iron & Metal Co. Ltd., 3380 Dundas street, has acquired a site for the erection of a plant for the manufacture of steamfitters supplies.

TORONTO, ONT.—F. B. M. Stevens Co., 926 McDougall avenue, Windsor, Ont., is reported to be considering establishment of a plant here for the manufacture of foundry specialties. Site has not been selected.

TORONTO, ONT.—Leland Electric Co., Dayton, O., and D. M. Fraser Ltd., Canadian representatives, have leased two floors at 7 Duke street and will install equipment and start operations immediately. Leland company makes fractional horsepower electric motors, automatic flashing equipment, and other products. Canadian subsidiary to be known as Leland Electric of Canada Ltd. will be organized.

MONTREAL, QUE.—Tower Oil Burner Co. Ltd. has been incorporated with 1000 no par shares by J. J. Meagher, 388 St. James street.

New Trade Publications

ALLOY STEEL—Darwin & Milner, 1260 West Fourth street, Cleveland, is distributing a booklet on its high carbon, high chromium steel, for use in quantity production press tools.

PICKLING—Weaver Bros. Co., Adrian, Mich., calls attention in a current leaflet to its service in all aspects of pickling practice in the metal field.

STEEL LOCKERS—Durabilt Steel Locker Co., Aurora, Ill., in a current bulletin covers the subject of lockers, for use in schools, clubs, industrial plants and other locations. Of steel, they offer many advantages.

OIL BURNER—Ryan Scully & Co., Philadelphia, in bulletin No. 4E describes its new model of low-pressure automatic oil burner for industrial application. It is illustrated and the text covers performance and operation.

INDUSTRIAL HEATING—Industrial heating equipment made by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is covered in a 100-page catalog, No. 247. Operating data, charts, tables and installation photographs are given. A control section is included, describing magnetic controllers, push button stations, furnace transformers, thermometers, thermostats, pyrometers and similar equipment.

ELECTRIC MOTORS — Loose-leaf catalog pages from the Century Electric Co., St. Louis, give specifications including power, speed, weight, price, and electrical characteristics of squirrel-cage induction motors ranging from 2 to 200 horsepower.

ALUMINUM PLATING — Aluminum Co. of America, Pittsburgh, in a current booklet discusses electroplating of aluminum, a process which has been under considerable discussion in recent years. The subject is fully treated and the publication is a handbook for the plater.

GAS PRODUCER—Bulletin No. 92 by the Wellman Engineering Co., Cleveland, is devoted to its gas producers. It gives full description of the construction and operation of its type of mechanical producers, with illustrations of details. Data on performance, expense of operation and cost of gas are included. Tables are given showing analyses of various coals, gas producer practice, and physical constants of gases.

SHAPE CUTTER—General Welding & Equipment Co., 70 Lansdowne street, Boston, announces in a current bulletin the addition of a portable type to its line of automatic shape cutters. It is designed for work of exceptionally large dimensions and for quantity production of shapes under a foot in width.

BUCKETS—A recent catalog from the Blaw-Knox Co., Pittsburgh, covers a line of buckets, including 600 sizes up to one cubic yard capacity. The equipment is adapted to excavating, material handling, and general contracting requirements. Typical uses are illustrated and design features shown. A reference chart gives detailed specifications.

SAFETY TREADS—American Abrasive Metals Co., 50 Church street, New York, has issued a catalog of its metal treads containing abrasive material to promote safety from slipping. A chapter is devoted to specifications for anti-slip safety treads and detail sheets are shown in miniature with a perspective view to aid the specification writer.